THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

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THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

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John A. Ferrall, Editor

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Work -- and Service. From the standpoint of the worthwhile budget, the important thing is the distinction between true and false economy rather than between economy and extravagance. Extravagance stands out so clearly that it condemns itself in short order, but the line between true and false economy is not always so clearly drawn. It might appear cheaper to walk 100 miles than to use even the lowest priced means of transportation, but it would scarcely be true economy.

The fruit and vegetable growing, handling and utilization activities in this country (land, greenhouses, and crops during an average year) constitute a four billion dollar industry, so that even minor improvements in methods or varieties, in disease control, or in handling, transportation or storage, mean actually millions of dollars each year saved to growers and handlers--and a better product delivered to the consumer. Thus an investment in agricultural research is almost certain to prove to be an excellent one from every point of view.

Methods worked out for the control of apple scab, bitter rot, and apple cedar rust, for example, save the industry ten million dollars a year; improvements in methods for combating late blight, mosaic and leaf roll of the potato represent an even greater annual saving; and improved methods of handling have cut losses from rotting of citrus fruits in transit from an average of around 20 percent to a mere 2 percent. A conservative estimate of the saving to the fruit and vegetable industry through improved methods and varieties resulting from the investigational work of this Division places the sum at $250,000,000 a year--which represents a 250 percent return on the investment in our work.

FUNDAMENTAL RESEARCH

In his presidential address at the meeting of the American Chemical Society in San Francisco last summer, Dr. Roger Adams declared that the United States Government because of its failure to recognize the importance of sponsoring theoretical scientific research might lose out in the race for fundamental discoveries upon which the future progress of the nation must depend. We know from the revolutions wrought by such fundamental discoveries in the past that this apprehension is well founded. As Dr. Adams pointed out, the basic and fundamental information for over 95 percent of the country's industrial processes has been discovered and described by investigators in what is known as pure or theoretical scientific research.

The history of agriculture shows that many of the greatest advances have rested on the discoveries of research specialists in laboratories and greenhouses rather than on the experience of the growers themselves. When a needed appropriation is refused, or an existing one cut so drastically as to injure the work, there is small comfort in the thought that the decision was no doubt the result of ignorance of the importance of the activity concerned. The average man would undoubtedly vote to eliminate an appropriation for such work as Mendel carried on with garden peas, yet we know that Mendel's work has been of primary importance in improving varieties of practically every plant that helps feed or clothe us.

At the outset of an address delivered at the opening program of the twenty-fifth anniversary exercises of the Brooklyn Botanic Garden, May 13, 1935, Dr. A. F. Woods summed up the importance of work with plants by saying: "All animals, including man, are dependent for food directly or indirectly on some form of green or chlorophyll-bearing plant life. The study of these organisms, that make life possible, is of as great fundamental importance as the study of man himself....

"Botanists, as well as other scientists, are frequently criticized for devoting too much time and money to what the critic considers to be quite useless and worthless but which may later prove of very great value. There are numberless examples. I have time to call your attention to but one in which the Bureau of Plant Industry of the U. S. Department of Agriculture found uses for an apparently unimportant discovery made by Karl Wilhelm von Nageli, a brilliant Swiss botanist. Von Nageli, desiring to study under the microscope the activities of living plant cells, selected for the purpose what is popularly known as 'frog spitle' or 'green slime', a fresh-water alga belonging to the genus Spirogyra....This study might not have appealed very strongly to the visiting committee of farmers and business men or the president of the university had they happened in at the time. They probably would have been more disgusted than was Nageli himself when he could not get the algo to grow in his carefully prepared synthetic solutions, containing everything needed by the alga in just the right proportion....To make a long story short he finally traced the cause of the death of the Spirogyra to minute traces

of copper taken up from the bronze faucet in his laboratory....the chlorophyll band in the Spirogyra cell reacted to one part of copper in 50 million parts of water....

"The next chapter in the story opens with a letter received by the Department of Agriculture from a cress grower, who complained that he and other growers were being put out of business by some disease attacking the cress. As this was quite an important industry in which many millions of dollars were invested, we sent Dr. George T. Moore to investigate. He found that the trouble was caused by Spirogyra smothering the cress. He thought right away of the work of Nageli and made arrangements to add copper, 1 part to 50 million, to the water in some of the beds. It worked exactly as Nageli stated. The Spirogyra was destroyed without injury to the cress. The cost was negligible. This led to a further study in the use of copper in destroying algae of various kinds in water reservoirs....The methods developed have now become standard sanitary engineering practice.

"The next development grew out of the observation that in these copper-treated waters certain species of bacteria were greatly reduced in numbers. These belonged to the colon group. Tests were therefore made on typhoid, para-colon, Asiatic cholera and related species. It was found that these could be destroyed in a few hours by the introduction of small amounts of copper sulfate or metallic copper without the slightest danger to those using the water....

"The next development grew out of the observation that mosquito larvae were killed by these traces of copper, 1 part to 10 million. Colonel Gorgas requested that we send one of our men with him to clean up the zone in the Isthmus of Panama through which we were to dig the Panama Canal. The late Karl F. Kellerman was assigned to the job and used the copper treatment exclusively in destroying algae and mosquito larvae when it was not practicable to use oil.

"The use of copper in water supplies was followed by a study of copper in animal nutrition. The results of that study show that it is absolutely essential along with iron for haemoglobin formation in the red-blooded animals. Its absence in the diet brings on secondary anemias that result in death if copper is not supplied. A trace of copper proved to be essential also to the growth of plants. What the next chapters will be I do not know. But I do know that Nageli's work on 'frog spittle' paved the way for work of very great value to humanity many years after he had passed away.

"We must encourage and support research in all fields. It is the only key to progress. Botanical research has made it possible to produce food sufficient for earth's teeming millions...."

As a matter of fact, of course, no appropriation is ever made exclusively for agriculture. The farm and its products are the foundation of our national life. These products not only feed and clothe us, but they also furnish the raw

materials for industry, and the commodities that in large part keep the wheels of transportation turning. An appropriation for agriculture is most decidedly an appropriation for the nation as a whole, for unless the farmer produces a surplus over and above his own needs there is nothing left for the rest.

The work of our Division is directed toward the improvement of methods and the increasing of efficiency in production. What such studies have meant in the past may be realized from the fact that the grower of today is able to produce half-a-dozen times as much as his grandfather did. In this country a little too much emphasis perhaps has been placed on increasing the output per man, so that we find ourselves now producing about four times as much per man as the average grower in Europe, but producing only half as much to the acre. This leaves before us the attractive problem of increasing acre production on the land to be cropped while keeping man production at its high level.

NUT INVESTIGATIONS

It is truly amazing what a slight change in methods at small cost may sometimes do in increasing yields while at the same time decreasing cost of production. During the past year in connection with scab control experiments with Delmas pecans in Texas the best results on our experimental tract were obtained by using a prepollination spray (bordeaux 1-1-1/2-50) followed by two applications of 2-2-50 bordeaux. An average of 80 pounds of nuts were harvested from sprayed trees; 27 from those not sprayed. In money returns, the nuts from the sprayed trees sold for $17.60 for the tree; from the unsprayed, $5.92. All of the trees were of the same size. One grower following our procedure sprayed 500 trees, the nuts bring $8,500 as against $3,000 for the nuts from 500 unsprayed trees. The spraying cost 80 cents a tree. Here we have a profit of more than $10 a tree from the use of the improved method--$5,100 for the 500 trees.

In the same locality irrigation experiments were conducted. The trees set a good crop of pecans but during most of the growing season the rainfall was deficient so that there was a shortage of soil moisture. The irrigated trees were able to carry their crop to maturity and produced 18 percent larger and 14 percent better filled nuts than those borne by the unirrigated trees. On the basis of commercial grading this meant an increase of 21 percent, or about $4.00 a hundred pounds. The yield from this particular block of Delmas trees was 36,600 pounds. If all the block had been irrigated and the grade increased proportionately, a reasonable assumption, the value from the irrigation would have been $1,400 through the increase of grade alone, and there would have been a considerable increase in total pounds of pecans produced.

Our nut production investigations also show striking examples of increased production through the creation of new and improved varieties. Data collected from the records of two of our new almond creations in California indicate that they possess so many outstanding points of superiority that they are likely to

supplant the standard sorts. One thing is evident now--that if these hybrids prove as well adapted to other districts as they have shown themselves to be to conditions about Davis, Calif., their introduction and commercial culture will be of outstanding benefit to the growers, an expert in such matters having placed the estimated increased income to growers from their use at $200,000 a year.

Practical methods have been worked out for overcoming the effects of dichogamy in walnuts by artificial pollination and the grafting in of varieties. Artificial pollination has proved to be remarkably successful and has now been extended to nearly all the dichogamous walnut varieties in the San Joaquin, Sacramento and Salinas valleys in California. During the past two years a great deal of time and attention have been given to bringing the practical application of artificial pollination to the attention of growers. Several talks have been given by our specialists to rather large gatherings of walnut growers at special meetings. Informal discussions with small groups of growers have been of value in explaining the methods. So far as possible the work of artificially pollinating some of the larger commercial orchards has received personal supervision and the results have been most gratifying. Several thousand acres of walnuts are now being pollinated artificially and in every instance recorded considerable increase in crop resulted. In some of the older orchards the yields of the artificially pollinated plots have been as much as ten times that of the unpollinated plots.

PEACH INVESTIGATIONS

Too, we occasionally tailor hybrids to measure. A few years ago one of the California fruit growers' associations suggested that if a peach could be produced having the shape of the J. H. Hale but with improved drying quality, absence of red color about the pit, increased sugar content and smaller pit, it would be a very useful addition to the variety group. So last year we showed this association five hybrids (J. H. Hale x Lovell-Halford III 21-6) which had just come into bearing, some of them meeting all expectations as to size, appearance and flavor. The date of ripening is about the same as that of the J. H. Hale.

Drying tests are being conducted of these and other hybrids--especially a promising Leader seedling 26-11 x Muir-Halford I 26-50 fruiting for the first time last year. The latter ripens earlier than the Muir and will make a longer season of good drying varieties, in this way increasing the efficiency of both labor and equipment.

For that matter, more than 100 new peach hybrids, the result of our work in breeding stone fruits, came into bearing for the first time last year; and new ones have been coming into bearing regularly each year for several years past. Some of them are sure to be valuable.

Among the early maturing clingstone peaches, for example, we have Leader seedling 26-13 and Pratt-Low x Tuskena (Tuscan) 21-1, which have already demonstrated superiority over the Tuskena. A sufficient acreage of these two new sorts has been planted in the Yuba City district of California to justify the opening of a cannery. Two others fruiting for the first time last year show even more promise in some ways. These are Tuskena-Paloro x Paloro-Pratt-Low and Leader Seedling 26-13 x Tuskena-Paloro. Both have been distributed for trial in the Yuba district and already their performance in comparison with the two other early-ripening clings shows them to be of unusual promise.

BEAN INVESTIGATIONS

During the year we have started out on its commercial career a new bean similar to the Stringless Green Refuge--but highly resistant to the common bean mosaic. Artificial inoculation under greenhouse conditions as well as field tests have thus far failed to produce any mosaic symptoms. Even where the new strain has been planted with other beans showing a high percentage of mosaic, it has shown no mosaic diseased plants. The quantity of seed available is limited as yet, of course, but a small amount has been distributed among seedsmen throughout the country so that the strain may be tested under a variety of conditions. Preliminary canning tests show the new hybrid to be of good quality, possessing the same light green color as the Refugee.

It is interesting to know, in this connection, that our specialists working with beans and peas have been able to originate and fix new sorts in about one-third of the time usually required. This is done by growing several generations a year. To develop pure strains of quality it is usually necessary to cross with less desirable but more resistant types and go on making selections until a desirable variety is secured. Ordinarily from 15 to 20 generations are needed to produce a disease-resistant variety, fix the type, and provide seed enough for commercial distribution. With only one generation a year, the average grower might very well be forced to abandon the crop before relief could be offered in the form of a new and disease-resistant sort. Last year our specialists were able to produce 4 generations of beans (3 in the greenhouse and 1 in the field) and 4 generations of peas (1 in the greenhouse and 3 in the field).

Rapid increase of seed outdoors may be secured in a number of interesting ways. Growing seed crops south of the Equator during the northern winters is theoretically the best, but high costs, long sea voyages and local unfamiliarity with American varieties are drawbacks. American peas have been successfully grown in New Zealand, and growing off-season crops in Argentine or other southern countries has been investigated. Three generations of peas can be grown in North America in one year, for that matter, by harvesting in Mexico in March, in California in June, and in Colorado in time for planting in Mexico in November.

FRUIT AND VEGETABLE HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS.

Many of the Division's achievements which result in financial savings to growers and others concerned are in connection with the fruit and vegetable handling, transportation and storage investigations. Some two years ago the Plant Disease Survey began an attempt to estimate losses which occur while fruits and vegetables are in the hands of the distributors and consumers. A preliminary report on the investigation argues that most of these losses may be avoided by right handling. Since the losses run as high as 25 percent in some fruit and vegetable crops, it is easy to understand the importance of our work in this particular field. We have pioneered much of the work, and are still in the midst of it, each year showing conspicuous savings made possible by improvements in methods.

In the orange precooling and transportation investigations, for example, it was found that noniced shipments precooled at railroad refrigerating plants for 8 hours could be forwarded without icing and with the ventilators closed for the first 24 to 48 hours, while traversing the hot desert region, after which ordinary ventilation could be used for the remainder of the time in transit. The adoption of our new method cut the cost from $25 to $15 a car, the saving representing something like $1,000,000 a year--or approximately the annual cost of all of the work of our Division!

A speaker before the meeting of the Pacific Northwest Advisory Board at Portland, Oregon, last spring mentioned enthusiastically the work of our specialists in showing the way to heavier loadings of pears without impairing the fruit in any way. "Considering only the Medford District (Oregon)," he said, "the net savings to growers effected by the heavier loading in normal years amounts to approximately $250,000.""

He went on to compare shipments from the Medford district for the years 1928 to 1934. In 1928, he said, 89 percent of all pears were shipped the first 2 months of the shipping season; 95 percent in the first 3. In 1934, 40 percent was shipped the first 2 months and 55 percent in the first 3. The daily range was even more pronounced. In 1928, on 5 days the shipments exceeded 100 cars, the peak being 136. In 1934, the peak movement for 1 day was 50 cars, all other daily shipments being 40 cars or less. Naturally, this means a tremendous saving to car lines and carriers as the same crop may now be handled with less than half the rolling stock formerly required, and an attendant reduction in switching and yard storage congestion. The improved condition of the fruit handled under the new method is reflected in the remarkable reduction in damage claims on pears, formerly regarded as a very perishable product.

We have worked something of a revolution in connection with the handling of Florida grapefruit through demonstrating that the fruits may be pulled from the tree and that this method (instead of the usual one of clipping off the fruit) actually prevents loss from stem end rot, one of the most serious decays affecting Florida and Texas grapefruit. Formerly it was believed that grapefruit could not

be pulled from the tree until it was dead ripe without running risk of tearing the rind in the region of the stem. Tests have been made periodically for the past two years and have shown conclusively that grapefruit may be pulled at any time during the shipping season without causing rind injury, and that the occasional lesions can be rendered harmless by treating the fruit with borax when it is received in the packing house.

The reduction in stem end rot resulting from pulling the stem from the fruit depends upon the amount of stem part left on the fruit. Ordinarily it is not difficult to pull fruit leaving little or none of the stem part adhering. What our studies have shown is that when the calyx points and stem cushions are left, stem end rot is not reduced significantly, if at all; when a portion of the calyx or cushion is left adhering, decay is considerably reduced; and when both the calyx points and stem cushions are removed, stem end rot is very greatly reduced.

By giving the pulled fruit the borax treatment on arrival at the packing house, decay is even further reduced. This procedure has been tried out commercially with satisfactory results. Apparently the stem end rot fungus gains easy entrance through the clipped stems. At any rate, when the fruit is pulled from the stem at the time of picking a corky layer develops which decreases losses from stem end rot. Pulling, too, is faster than clipping--and cheaper. Moreover there is not the danger of the sharp stem buttons cutting the peel of other grapefruit. Such cuts allow entry of blue mold and other organisms that cause decay. The great difficulty with stem end rot is that it develops in apparently sound fruit sometimes after picking, perhaps in the retail store, or even in the hands of the consumer.

In connection with disbuttoning fruit for the purpose of checking decay, stem removal tests with fruit harvested (clipped) and gassed in the usual way have been made in the fall at the time when stem buttons normally loosen during the gassing treatment and many fall out during the scrubbing process. These tests were prompted by severe stem end rot outbreaks in shipments of Florida fruit. An inspection of cull fruit in packing houses showed that there were some three to ten times as much stem end rot in fruit with stem buttons adhering as was found in fruit that had lost its stems, presumably during the washing process.

On the basis of these findings, several packing houses put two or three extra helpers on the grading belt and assigned them the job of removing, by slight pressure of the thumb against the stem, the stems from the fruit that had not already lost them during the washing process. Where this treatment was followed decay was reduced immediately to nominal proportions. This development is almost certain to be used more extensively early in the fall when fruit prices are high and when stems are loosened by the gassing treatment, but probably it is not workable later in the season when stem buttons are not normally loosened by the gassing.

Borax continues to be unsurpassed as an antiseptic for use on citrus. However, it has serious practical disadvantages, centering around the question of solubility, necessitating the use of boiler heat throughout the greater part of the season in order to keep the necessary concentration in solution.

Sodium metaborate, which has a much higher solubility than borax, has been found to be practically as effective as the latter. When this borate is used, heat is not needed at any time during the shipping season in order to keep it in solution. This means a decided financial saving. The efficacy of sodium metaborate was determined under laboratory condition at first, and then tried out under packing house conditions, with the result that it is being taken up rather extensively by packing houses and has now been in use for a year or more with satisfactory results.

Sodium metaborate has been used not only in "preboraxing" tanks on the platform, but in the flotation tank where frozen fruit is separated from sound fruit, and also in the soaking tank. In addition to being a satisfactory antiseptic, it seems to possess satisfactory detergent properties, thereby accomplishing two purposes. Shippers are taking to this substitute for borax because of its economical advantages. The only practical disadvantage developed so far is that it has a tendency to chap the hands of workmen who are in continuous contact with it, but the use of rubber gloves overcomes this objection.

VEGETABLE VARIETY STANDARDIZATION

We have been cooperating for the past few years with State agricultural experiment stations, growers and seedsmen in working out standards and descriptions for vegetables. We want to make sure that growers are offered nothing but the best for planting. Already the general quality of seed offered is distinctly better than it was only a short time ago. Seedsmen have been made to realize that there is no need to handle so many varieties and differently named strains; that they need not try to supply seed of 4 or 5 named varieties that are in fact almost identical. The result is that both dealers and growers are devoting more care and attention to seed crops of the more important varieties and so are better able to improve the quality and purity of the comparatively few strains of each vegetable really of superior value.

Fruit growers have already learned how much it means to them when a buyer in Boston, say, can telegraph to the Valley of Virginia and order a carload of U. S. No. 1 Delicicus apples in standard bushel baskets and know exactly what he will get if the product actually conforms to the specifications of that grade. We are working to give the vegetable grower the same help--and the buyer the same confidence.

Especially do we expect to bring order out of the confusion now existing when vegetable growers make up their seed orders. A grower may admire the superiority of a neighbor's crop of tomatoes over his own, and resolve that the following

year he will grow the variety his neighbor grew. He orders the variety by name but from a different seedsman. When his crop reaches maturity he finds that while the tomato is different from the sort he grew previously, it is also different from the tomato grown by his neighbor. When he complains, the seedsman insists that he sold him a very fine strain of the particular variety in question, which may be true, and the strain may be uniform and of good quality--but it is not the tomato the grower wanted.

This situation exists because at present seedsmen and growers do not agree upon exactly what characteristics a certain variety should possess. Standardization is the solution of that problem, and to bring that standardization about all that is necessary is to get seedsmen and growers to adopt the descriptions or specifications of some authority whose recommendations they are willing to accept. We believe they are well on their way toward accepting us as the authority.

So far as establishing standards is concerned, it really doesn't matter so much whether the standard accepted represents something a little larger or smaller than you had in mind. The important thing is to get the same picture before everyone who is interested in the variety in question so that all can understand exactly what is referred to when the variety is mentioned. We are, of course, aiding in this through the publication of our bulletins illustrating standards for various vegetable crops. These standards are based on the best obtainable cross-section of opinion of leading horticulturists, investigators, seedsmen and growers. The standard is not set so high that it cannot be reached, but is based on samples taken from the best obtainable stock, representing a product of sterling quality, usually superior to the majority now offered for sale. The standards are flexible, subject to revision from time to time as conditions require or as new and superior types are developed.

It should be emphasized that standardization does not mean reducing things to a dead level of sameness and mediocrity. The standard selected will be representative of the best and will meet certain definite specifications tending to guarantee its quality and enabling the purchaser to know just what to expect. It is quite certain that the industry will not allow the product to fall much below these specifications--for fear of injuring its reputation and commercial value.

This fear that any lowering in quality of an established product may result in loss of reputation and so hurt sales no doubt lies in back of the strongest argument in favor of standardization--the fact that experience has shown that standardization almost always works toward the improvement of the product. In other words, when an industry begins to standardize, it will usually standardize at the highest practicable level of excellence, and that level will be maintained to protect the reputation of the product.

There is no need for concern over the possibility that the attempt to reduce the number of vegetable varieties and to emphasize certain types as desirable for commercial culture will discourage efforts to produce new varieties or modifications

of old ones. The pressure urging the production of improved sorts and the scientific enthusiasm over plant breeding and improvement will tend to result in the introduction of more good varieties in the next few years than have ever been introduced in an equal time before. Varieties of superior merit will continue to displace standard sorts regardless of what we say or do not say.

TOMATO INVESTIGATIONS

The tomato is an excellent illustration of this. Of late years it has taken a more and more prominent place in the spotlight, and the latest development, the amazing demand for tomato juice, is pushing it still farther to the front. The tomato crop is now valued at more than fifty million dollars a year, about half of which is for tomatoes used by canners and manufacturers. Almost a dozen of our new varieties are now grown commercially, worth perhaps as much as ten million dollars a year. Under the circumstances it would appear that the major objects of the tomato breeding work had been attained and the investigations could be reduced to a minimum. We find, however, that we must go on producing new varieties to meet special needs, in spite of the high value of those already introduced. The demand for new sorts specially adapted for juice production, is an illustration.

Too, we find that it is sometimes desirable to develop varieties to meet the needs of special regions. The new Glovel tomato, a hybrid of the GLObe and MarVEL, is a case in point. As a market variety is has consistently outyielded its famous partner hybrid, the Marglobe, in experimental tests at Homestead, Fla. It resembles the Marglobe and is resistant to Fusarium wilt and nailhead rust, while the vine growth is vigorous and distinctly more open than that of the Marglobe, with the fruit partially exposed. This open type of growth is favored by South Florida growers in ordinary seasons as making it easier to spray and pick the fruit—and selection was deliberately made for this character.

DISEASE-RESISTANT STRAINS OF FRUITS AND VEGETABLES.

The tomato hybrids are also an excellent illustration of the fact that the most effective method of combating diseases is to create varieties resistant to them. This is a field that is becoming of even greater importance now than in the past because with the more intensive cultivation of crops, the improvement in transportation and the consequent freer exchange of plant material, there is naturally a more rapid spread of diseases. Some of these plant diseases cannot profitably be controlled by any method of spraying or dusting that has been developed so far. Disease-resistant sorts are needed.

While it is very rarely that we are able to find a new strain or develop one that is practically immune to a disease, that is really not important from a commercial standpoint. If varieties are secured that show a high degree of resistance to diseases, then commercially profitable crops may be grown.

Thus, recognizing that the increasing severity of virus diseases of potatoes is perhaps the greatest single difficulty in potato production in this country, we have created by breeding and selection a number of varieties showing resistance to mild mosaic and scab, with some giving promise of resistance to late blight. Two of these new potatoes are already important commercially. Approximately 100,000 bushels of the Katahdin and 1,500 bushels of the Chippewa were grown in the various cooperating States in 1934.

So, too, the serious disease, cabbage yellows, which at one time threatened ruin to cabbage growers and kraut factories in certain regions, was met effectively by creating resistant sorts. In this case we went a good bit beyond that and actually succeeded in producing disease-resistant counterparts of the leading susceptible varieties!

Two of our new varieties of lettuce, resistant to brown blight, have surpassed even our highest expectations. Nearly all of the 30,000 acres of the winter crop of lettuce in the Imperial Valley of California are planted to these varieties, and so is a good part of the 25,000 acres of lettuce grown in Arizona.

An interesting case of disease-resistant fruits is that of the so-called Perrine lemon, which we originated by crossing the West Indian lime and the Genoa lemon. The hybrid, which looks a good bit like a lemon and can substitute for it in practical use, has most surprisingly inherited resistance to both lime withertip and citrus scab, the worst diseases of the lime and lemon parents, respectively! Preliminary tests under field and grove conditions indicate that this new fruit has a very promising future in Florida.

Our strawberry hybrids are excellent proof of the fact that standardization or no standardization you can't keep a good variety in the background. The Blakemore is likely to rank third in importance in the United States before another year has passed; the Dorsett and Fairfax continue to succeed well in the East; the Southland is generally considered the best home garden variety for the South; the Bellmar is of importance locally in North Carolina; and the Narcissa and Redheart are succeeding very well in the Pacific Northwest. In fact, one of the large frosted food concerns has written us recently that it is preparing to freeze 100 tons of Redheart strawberries in Oregon this year, paying a premium of 1 cent a pound over the Marshall to encourage growers to plant the Redheart. And we still have 20,000 promising strawberry seedlings undergoing tests!

SEASONAL COMPOSITION OF STRAWBERRIES

We have done some interesting work with strawberries in connection with our fruit utilization studies. The biochemical changes occurring during the development of the strawberry fruit were studied during four seasons, employing 12 varieties, including all the more important commercial varieties of the Eastern

States. Samples for analysis were collected at intervals of 5 to 7 days from the fall of petals to full ripening. The 12 varieties fell into four groups: A low-sugar, low-acid, low-astringency group; a low-sugar, low-acid, high-astringency group; a medium-sugar, high-acid, medium-astringency group; and a high-sugar, low-acid, low astringency group. The chemical characteristics of each of these groups as they affect the suitability of the fruit to various preservative treatments were considered in some detail. While none of those tested is especially adapted to the preserver's use, primarily for the reason that the ratios of acidity and astringency to sugar content which are acceptable in a fresh fruit are too low to permit retention of balanced flavor and palatability when the fruit is preserved with sugar, the medium-sugar, high-acid, medium-astringency group most nearly approached the type desirable.

ORNAMENTALS

It has been said that a world without flowers would be like a face without a smile, so that it is gratifying to realize that our Division has always included ornamentals in its program. For that matter, the growing and handling of ornamental plants furnishes a livelihood for thousands of people in this country. Two of our most popular bulletins concern themselves with rose growing and landscape design--and have reached a circulation of more than a million and a half copies each!

Our specialists put down the foundations upon which the commercial bulb industry of this country has been built--and put them down at a time when they were told quite bluntly that the thing could not be done. Well, growers of the United States are now producing daffodils and irises in large volume and are well on their way to replacing with home-grown bulbs the millions of dollars worth of narcissus and tulips still imported. And we do not stop with the mere establishment of a new industry; we watch over it. An example of this is the working out of methods that reduced losses 75 percent in the case of narcissus bulbs attacked by basal rot. This rot threatened the ruin of growers in New York State, for example, where the industry involves $200,000 a year.

The experience of rose growers in recent years in the use of manetti stocks in propagating rose plants for forcing was costly and unsatisfactory in many cases, because of the failure of the plants to grow or to develop properly. Investigations by our specialists showed that the principal difficulty was due to the stocks being dug prematurely and before the wood was well ripened. The principal growers of manetti stocks in the Northwest have adopted our suggestions and are now delaying the digging of the stocks until no doubt remains as to their maturity. Incidentally, the starch test for maturity, developed as a part of our investigations, is being used.

A NEW FUNGICIDE

The Annual Report of the Chief of Bureau tells of our experiments in the use of a new copper phosphate fungicide and the carrier, lime-bentonite, in spraying apples, pears, peaches, and grapes in the vicinity of Washington, D. C., in Missouri, Arkansas, and elsewhere during the growing season of 1934. In the case of peaches a small amount of leaf injury developed from the earliest applications, but later applications caused no injury. In the case of apples to which lime-sulphur and bordeaux mixture were applied according to the normal spray schedule, severe injury to foliage resulted, while the new fungicide caused no injury. During the severe drought period of midsummer it was observed that apple trees treated with copper phosphate retained their leaves, while trees otherwise sprayed lost a large proportion of the foliage. The new fungicide was effective in controlling the leaf spot disease of Kieffer pear, and was largely responsible for a decided increase in the fruit crop. Applied to Concord grapevines, it proved to be less injurious to the foliage than bordeaux mixture. Vines sprayed with it appeared to resist drought better than those otherwise treated. Present indications are that this new spray, composed of copper phosphate, lime and bentonite, with the use of an effective sticker, may largely if not entirely replace some of the older fungicides in the control of many of the apple, peach, pear, and grape diseases. It may not be fully effective, for instance, in the control of severe infections of apple scab in highly susceptible varieties.

Naturally, the day's work is not made up entirely of these revolutionary discoveries and improvements. The rather natural tendency of growers to try anything that promises to pay good returns constantly leads them to plant crops concerning which they know very little, and on which they soon need help. An illustration of this turned up in South Carolina last season when honeydew melon growing, a new industry in the particular section concerned, met with a serious setback in the form of anthracnose injury. One of our specialists, called to the aid of the growers, was able to show the way to check the disease to such an extent that a good yield was had over the entire harvest season and growers are planning to extend their acreage. Without this technical aid the venture would have been a failure, and a rather serious financial setback to some growers. In fact one grower credits us with having saved him $16,000 by our advice, a sum which represents several times the annual cost of the project involved. It is quite likely that all of our projects actually pay their way through the incidental help of this sort rendered to the fruit and vegetable industry, so that the outstanding accomplishments are pure "velvet" as the saying goes.

ADMINISTRATIVE ASSISTANCE.

Back of our field and research workers stand the administrative and clerical force--they also serve, and well. It is astonishing how much paper work is involved in research activities, even where it is kept to the absolute minimum. The fact that this work is done well has a tendency to make the Washington employee somewhat misunderstood and occasionally unpopular with the field force.

"The Washington end of things to the field man," said Mr. H. E. Allanson, Business Manager of the Bureau, in a talk to field workers some years ago, "all too often is an abstract sort of place where he sends letters and sometimes gets replies--a sort of brake, a machine-like sort of proposition that cold-bloodedly deducts from his accounts anywhere from 13 cents to as many dollars for excess expenditures for anything from laundry to storage of automobiles, and never adds anything to the account. It is made up of the men he knows, who are really human beings, sympathetic and constructive, and the ones he does not know, who are usually vague, indefinite, but omnipresent machine-like individuals, unsympathetic, uninformed on the work, and generally reactionary, who somehow are just where they can't be reached, but very real as they are always the ones to blame for this or that calamity in the progress of a reimbursement voucher.

"And yet, in spite of their reputation, in spite of the evidence, these men at headquarters are really quite human. Contrary to the popular conception of the field man, they put in a good day's work each day, they do their best to help the field men get back all possible from their accounts and as quickly as possible, and they understand and sympathize with them in the problems they have to meet....

"We are all one big firm--big in numbers, big in the volume of our work and our undertakings, and big in the area we cover. And right there may be where many of our difficulties lie. The quantity of work, the enormous volume resulting from steady streams pouring in from every section of the country into the one headquarters, makes organization imperative. It is like the downtown traffic of a large city, streams of people afoot, in automobiles, cabs, streetcars, trucks--a multitude of humanity in all kinds of vehicles. If the traffic is well organized, the crowds move systematically with little loss of time; if not, chaos results, with a traffic jam, the proportions of which depends upon the amount of disorganization. There is traffic direction of all sorts--signs, lights, ropes, railings, policemen. The fiscal and administrative regulations of the Department are the traffic guides that direct the volume of business necessary in the activities of the Department of Agriculture. Just as surely as a pedestrian, straying out of the prescribed paths, is caught in the vehicular traffic with disastrous results to himself and a tie-up of traffic affecting all, just so surely does failure to observe departmental rules and regulations result in difficulties for the individual and a general disturbance and slowing up in the movement of business.

"Point of view has a tremendous effect. If we make up our minds that a thing is bad, it is bad--for us. I have little sympathy for the man who as a member of the organization spends perfectly good energy in lambasting what is called red tape. We are trustees of public funds, and it is to be expected that certain safeguards will be required that an individual handling his own funds would not exercise. The man who complains about red tape would be the first to criticize

a lack of checks and balances, of reasonable supervision over the public's funds. We must remember that all Government funds are paid out by one agency, the United States Treasury. Manifestly, one set of rules only would be practicable. If one agency were granted a special set of rules, a precedent would be established and the net result would probably be a different set for each of the many agencies expending funds. Obviously this would be impracticable and undesirable. Each department makes such additional regulations, not inconsistent with those of the Treasury, as may be desirable in the administration of its work.

"No apology should be made for the rules and regulations of the Department of Agriculture. It is my experience that more delay is caused by failure to give complete information when transmitting an account or a recommendation than for any other single reason. We find it important with respect to all matters of Department business to have each thing self-explanatory when it goes through. A transaction which may appear to be erroneous, irregular or illegal often may be satisfactorily explained later, but the explanation always lags behind the criticism, never receives the same distribution, and never corrects the harm that has been done. It is our effort in the business administration of the bureau to have every transaction self-explanatory as it goes through. If a person uses common sense in his business dealings and then passes on to us full information as to the factors involved, he will find the bugaboo of regulations disappearing rapidly. Also, if he will then mix with that common sense just a little study of the regulations, his troubles on that score will soon become history.

"In an organization such as ours it is imperative that the work be conducted in an orderly fashion, complying with such laws as may be passed by Congress and with such regulations as may be issued by properly constituted officials. These laws and regulations are condensed and put into handy form for use and guidance of employees as the Administrative and Fiscal Regulations. They are signposts directing the way in order that all laws may be faithfully complied with and uniformity in procedure established, permitting efficiency and expedition in handling the large volume of work. These regulations are made to help, not hinder. They are made by some agency or individual who is a member of our firm, equally interested with us in so conducting the work as to insure its integrity and efficiency. Perhaps in some cases we do not understand why the particular regulation was made and what good purpose it serves. We must remember again that the Government is a big business, expending billions of dollars each year, and the rule or regulation we may not need or that may seem anything but helpful, quite likely is serving a real need in some other branch of the service.

"When your accounts are being prepared for submittal, always remember that the final word will be spoken by skilled auditors who may be entirely unfamiliar with the conditions under which your work is done. Therefore prepare your vouchers so as to have all of them self-explanatory. If an unusual item gets by once without an explanation, do not use that as a precedent and try it again; rather, congratulate yourself on the accident and furnish the information necessary for a full and clear understanding of the matter when sending in a comparable voucher later on."

In this connection, it may be that a word of explanation as to what happens to vouchers in Washington will give you a clearer understanding of why so much care is necessary in preparing them. From your project leader they go to the accounting section of our Business Office. Here the auditors look them over and through their familiarity with our work are often able to furnish supplemental explanations or information necessary to carry the account through safely. From the Division the vouchers go to the Bureau's auditors who give them a very thorough and careful examination before sending them along to the Treasury Department from which, of course, the checks are mailed. As Mr. Allanson has stated, however, the final word comes from the Comptroller General. If he says the account is illegal for some reason or another, the money must be made good from somewhere. If it cannot be collected from you, or from the person or firm to which it was illegally paid, then the officer who made the payment, and who is bonded, must make good. This naturally tends to a degree of care and conservation in the auditing of all accounts!

In the same talk, Mr. Allanson pointed out how much the general point of view regarding the Department and its work may be influenced by the conduct and personality of a single employee. Impressions of the Federal Government, far reaching in their effects, are often found to rest on the conduct or attitude of just a few employees engaged in Government activities in a given locality. The impressions and reactions from the conduct of these workers become effective in many ways--through the press, by letters to Members of Congress, and now and then through Members of Congress themselves who may come in contact with the employees. What you do and the manner in which you do it may have a far reaching influence and actually affect seriously the needed support for our work. A man who is apologetic for the organization of which he is a part is wrongly placed. Pride in our Division naturally begets respect in others.

Our publications have an even wider field of possible influence. In general we have very good reason to be proud of them. Not only are they among the most popular issued by the Department, but we have managed to cover our field surprisingly, having now publications relating to most of the important fruit and vegetable crops, their growing and handling. The wide distribution of these publications makes necessary more than ordinary care in their preparation. From the standpoint of the Department's editors, it is felt that regardless of whether or not a writer has the natural or acquired faculty of good expression, it is not too much to expect that he should at least see to the accuracy of his material, i.e., statements of fact, technical terminology in his own field, computations, citations, and the like. They often have occasion to point out invalid or erroneous names of genera, species, and horticultural varieties, incorrect citations, inaccurate calculations, lack of agreement between text and tables, poor arrangement of data, and other discrepancies and errors. Such matters seem to belong mostly in the sphere of the author.

There is a school of thought that holds that a research writer should be permitted to report his work in his own free way, without the doubtful benefit of editorial ministrations, leaving him and his work to be appraised accordingly by his scientific fellows. As a matter of abstract, if sometimes brutal, justice there is much to be said for such a plan--if the whole responsibility rests upon the author. But in our governmental scheme of things the institution as well as the individual bears a definite responsibility and may also have a reputation at stake, and although the personal inclination of a writer may be to emulate the style of the trailing-arbutus or the rambler rose, the exigencies of departmental administration and economy may call for training on a trellis of prescribed form--or even for drastic pruning.

"Sometimes, perhaps, it seems to you as though the demand for information about your work, the preparation of reports, the compilation of data, is endless," comments Mr. Allanson. "This study of our work serves two conspicuously useful purposes--it keeps our future policies trued up with our accomplishments, and it keeps us in a position to furnish those who determine the availability of funds for the continuation of our work the information they must have in justice to their trust to determine whether the results from funds expended warrant additional expenditures."

VIEWPOINT AND PERSPECTIVE

Writing on the importance of viewpoint and perspective, a former Assistant Secretary declared that there are two ways of looking at a position in the Department--as a job, or as an opportunity for service. To get this more desirable viewpoint of regarding the work as an opportunity for service, the employee must have an adequate conception of what the activities of the Department mean to the country at large and of what they promise for its future. He must realize the significance of the social and economic functions of the Department and feel that he is a coworker in an organization maintained by the people for noble ends, and that it is a privilege to use his best endeavors to further these ends.

Whether an employee looks back on the year just closed with some satisfaction, and forward with optimism to the year just starting, will thus depend upon whether he regards his work as a job or an opportunity for service. The late Sir Horace Plunkett, Ireland's great authority on agriculture, once referred to the United States Department of Agriculture as "the most useful institution on earth." No matter how relatively unimportant our work may be, we are all more or less important cogs in this great organization.

In one of his essays, Elbert Hubbard compares organizations such as ours to a steamship bound for the port called Success. It takes a large force to operate the boat, and to run it with the greatest efficiency the force must have a singleness of aim and a desire to do the right rhing. On all such boats, however, some members of the crew fall overboard.

"When a man quits his work, say, oiling the engine or scrubbing the deck," says Hubbard," and leans over the side calling to outsiders, explaining what a bum boat he is aboard of, how bad the food is, and so on, he loosens his hold gradually and falls overboard. There is no one to blame but himself, but you probably will have hard work to make him understand that little point. When a man is told to do a certain thing and there leaps to his lips, or even to his heart, the formula "I wasn't hired to do that," he is standing on a greased plank that inclines toward the sea. When the plank is tilted to a proper angle he goes to Davy Jones' locker, and nobody tilts the fatal plank but the man himself. And the way the plank is tilted is this: The man takes more interest in passing craft and what is going on on land than in doing his work on board ship."

More and more of the large commercial organizations are devoting time and money to the problem of developing effective team play among their employees--to getting the various units to intermesh effeciently while still retaining their independence of action and their individuality. They want to keep their workers too much interested to spend time leaning over the side of the boat.

That is the NEWS LETTER'S ideal also. It tries to be, like the organization it seeks to represent, an instrument of service. Above all it wishes to help you--to make your work easier, to make it more effective, and to make it more interesting. Once you really grasp the importance of the work being carried on, you will not need to be told that you have before you an opportunity for service--and not merely a job.

The NEWS LETTER thus tries to be instructive as well as informative--to show you what the Division is doing, what it has accomplished in the past, and something of its aims for the future; as well as to keep you posted on the latest administrative and fiscal rules and regulations, information that should aid greatly in keeping the machinery oiled.

The reports from field workers tell you something of what is being done by your research colleagues, giving you the benefit of their experience and findings. We hope to have more of these as time goes on, greatly extending the exchange of ideas.

After all, cooperation is the cornerstone of team play. You know how it works: You have a dollar and I have a dollar--we swap. Now you have my dollar and I have yours. Neither of us has benefitted. But if you have an idea and I have one and we swap, then each of us has two ideas. Our capital has been doubled.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

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Intangible Service. In a letter recently received here touching upon almond growing in California, Milo N. Wood has this casual comment: "We have, of course, been able to prevent a great deal of the planting of almonds under wrong conditions, and I am still hammering on that. I feel that this saves the growers thousands of dollars every year."

You bet it does--and the comment serves to call attention to a very important feature of our work, a feature that ordinarily receives but little credit. The sort of thing that Mr. Wood mentions is almost typical of the everyday help given by almost every research worker. It is a negative service, in a way, but it saves the grower money and in agriculture as well as in other fields of endeavor, a penny saved is a penny earned.

For that matter, if you will run over a list of our publications, you will find an astonishing number issued to warn growers rather than instruct them in production methods, etc. The splendid series of publications being issued in connection with the vegetable standardization investigations is an outstanding illustration of the manner in which we help growers avoid the planting of inferior varieties, for instance. Other publications warn against fraudulent schemes of one sort or another, land booms, planting of crops in unsuitable locations, and so on. In this case the list of publications is not a very good indication of the work we are doing in that field for usually the situation demands immediate attention and must be handled by means of mimeographed warnings distributed widely in the regions concerned, by press notices, or even by direct correspondence.

FRUIT AND VEGETABLE HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS.

W. T. Pentzer, Fresno, Calif.

In a general summary of activities during the latter part of 1935, he writes: "Since the last report the activities at the Fresno station were confined largely to work with grapes occasioned by the harvesting and storage of this season's crop. In September and through October records were obtain on the precooling of grapes with various kinds of equipment and the night of the heavy frost, October 30, when it reached 26° in some localities, we were taking temperature records in a car of grapes at Sanger. There was a time when it appeared that we could have hastened cooling by disconnecting the precooling unit and opening the doors and vents of the car, despite the efforts of a unit equipped with a 30 h.p. compressor.

"Most of the experimental pack of grapes were harvested and in storage before the freeze, although we were caught a little short of our intended pack, along with a great number of commercial operators. Some vineyards have been a total loss this season because of the freeze, but others escaped long enough to get most of the crop harvested. Some slightly frosted grapes have been shipped to market with good success, and some lots are being held in storage in good condition. Our experience, verified again this season by some storage samples, is that the stems of the frosted grapes are easily invaded by mold, and while the usual mold treatment with sulphur dioxide will retard mold growth for a time, there is only a short period in which the grapes remain salable.

"During the week ending December 21, another cold spell has been experienced with temperatures as low as 23 to 25° in some districts. There is some concern over the possibility of damage to the young Valencia orange crop. Most of the Navels in the central California district have been picked."

POTATO INVESTIGATIONS

W. C. Edmundson, Greeley, Colo.

"It appears from the newspaper reports that we are having a much milder winter here than they are having in most parts of the United States," he comments in his report of December 30th. "The nights are quite cold, the temperature often dropping to 4 or 5 degrees above zero, but the days are quite warm for this time of the year. The men working on our WPA project have not lost a day due to inclement weather.

"The annual Weld County Farmers' Institute will be held Thursday, Friday and Saturday of this week. I have been asked to appear on the program and discuss the work of the Station. I am also preparing an exhibit of seedlings that will be on display at the Annual Seed Show, which will be held in connection with the Farmers' Institute. The Weld County Farmers' Institute and Seed Show are always very well attended."

NUT PRODUCTION AND DISEASES

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending December 21 was spent in further field surveys in the vicinity of Corvallis and Eugene, Oreg., respectively, of the probable damage to walnuts and filberts from the unseasonably cold weather which occurred during the latter part of October. Little, if any, injury was found in all the filbert orchards examined in these districts. In the walnut orchards, on the other hand, considerable more damage was found, varying from a negligible amount up to severe injury.

"In general, orchards in the vicinity of Eugene, Oreg. are not seriously injured, the type of injury observed being mostly a light buff discoloration of the bark on the trunk and branches. In the vicinity of Corvallis, on the other hand, serious damage was found, particularly in river bottom plantings. For instance, on Kiger Island, about 5 miles south of Corvallis, there is a 100-acre orchard of 3-year-old Franquette walnuts which was very badly injured by the freeze. In this planting it is estimated that between 50 and 75 percent of the trees have been killed to the ground line. In the remainder the bark on the trunk is a light buff color which may clear up if the weather is favorable for the remainder of the winter.

"About 1 mile west of this planting there is an orchard of Franquette walnuts, about 20 years of age, which has also been injured, although in this planting the form of injury is different than in the young orchard. In this orchard it is the buds, catkins, and twigs of the current season's growth which has sustained the greatest amount of damage. It is estimated that about one-half of the leaf and flower buds and 75 percent of the catkin buds are dead in this orchard. A large number of twigs which bore fruit this year had likewise been badly injured. Twigs which did not bear fruit this season were not seriously damaged. The trunks of the trees in this orchard were only slightly injured.

The factor, or factors which have been responsible for this difference in the degree of injury around Eugene and Corvallis, respectively, is not definitely known. However, weather records show that it was several degrees colder at Corvallis than at Eugene, although it does not seem reasonable to attribute the great difference in the degree of injury in these two regions wholly to this factor. It may possible be that walnut orchards in the vicinity of Corvallis were not as mature as those in the vicinity of Eugene and hence not as susceptible to winter injury."

NUT PRODUCTION

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory the middle of December he reported the calculation of the drop data as sufficiently advanced to allow for a few general conclusions. These are:

"(a) Bagging the clusters of Schley and Stuart varieties reduced the drop of nuts as compared to the unbagged clusters; (b) bagging Teche clusters in all cases increased the drop as compared to the unbagged clusters; (c) there is a varietal difference in percentage of drop in that Brooks, Stuart and Moor varieties, both with bagged and unbagged clusters, dropped a smaller percentage of the nuts than the Schley and Teche varieties) (d), irrigated Schley trees dropped a higher percentage of nuts than non-irrigated trees; (e) good cultural conditions decreased the percentage of nut drop; (f) both defoliation and girdling increased the drop of nuts; (g) on Schley scab materially increased the drop of nuts and decreased the difference in drop between the unbagged and bagged clusters; and (h) the difference in drop between bagged and unbagged clusters in Schley at Philema was the greatest obtained from any location, the drop in the unbagged clusters being very heavy even though scab was a very minor factor."

That paragraph-report is a striking illustration of putting things in a nutshell--it must be close to a world's record for conciseness. Now, if Max Hardy is able to work out methods that will guarantee pecans being as full of meat as his report, the growers will name their best variety after him. And--pardon us--a Hardy variety would mean a lot to the pecan industry of this country!

"Nuts are still moving out of Albany quite rapidly," he had written December 21. "The writer has not heard of any great quantity going into storage. Prices remain about stationary and at a relatively low level. The crop around Albany and throughout Georgia has failed to materialize to the extent of an estimated 10 percent increase over the 1934 crop, some men even indicating a belief that there will be a slight decrease. One of the surprises of the 1935 crop was that many of the nuts of the Mobile variety produced in this section went A grade."

Writing from Albany on December 28th, he says: "The Christmas season was ushered in by a cold wave and a light fall of large-flaked snow, followed by sleet and rain. The end of the week saw a new all-time record of 9 successive nights when the temperature dropped below freezing. Despite the cold very little injury to semi-hardy vegetation has been noted, probably due to the lack of abrupt temperature changes."

DISEASES OF ORNAMENTALS

Frank P. McWhorter, Corvallis, Oreg.

An English newspaper tells of a man who behaved with conspicuous gallantry during a great flood at Mudcombe, and who was referred to quite often thereafter as the "Hero of the Medcome Floods." However, he turned out to be mortal, after all, and passed on to his fathers--that is to say, he died. Shown around Heaven by Gabriel, he was introduced to a group of venerable men as the "Hero of the Mudcome Floods." They listened with deep interest to his story--all except one very old man who continually sniffed. "What's the matter with him?" asked our hero. "Doesn't he believe me?" Gabriel shrugged his wings. "Don't mind him," he said, "It's only professional jealousy. That's Noah."

Of course, there is nothing that could be termed professional jealousy between pathologists and horticulturist, but they naturally have a somewhat different viewpoint concerning the importance of their particular lines of investigation. Hence the report below, brief as it is, will cause discussion. The pathologists are going to feel that it is quite a comedown for a plant pathologist of Frank's standing to work on one of these simple horticultural problems, though, of course, this particular problem has its pathological aspect, so that he hasn't irreparably soiled his hands. The horticulturists, of course, will be delighted to see that he has at last found some real use for his talents.

"With the ultimate purpose of accomplishment within the pathological realm we have stooped to horticultural endeavor," he begins, indicating that he suffers the pangs of remorse. "Subject: Regal lilies. Theory: Lilies with roots cut off would pack and ship better than lilies with roots on, and would be more readily adaptable to mild disinfection. Limiting factor: Would cutting the roots materially affect growth? The last consideration became the first determinarion and now, with two years' record we can say it did. The differences are significant. Outstanding points are:

"Marketable sizes of Regals with roots left on increased about 4 inches in circumference in 2 years; root-cut bulbs, 3 inches. The increase in circumference approaches a constant and was not proportionate to the size planted. The gain in weight of the uncut was nearly three times the cut. The first season the heighth of the uncut was nearly double that of the cut; the second season the uncut averaged one-third higher. Conclusion: Cutting Regal roots inadvisable.

"Ruminations:* Our determinations deal with Regals but what about other lilies? Longilforums are imported with roots clipped. Is this not an argument for growing our own Easter lilies? And perhaps root cutting spreads a virus. The common lily virus is in the tulip-breaking group and cutting tulip flower stems will spread mosaic between tulips. Let us grow our own lilies!"

*Term frequently used in "cow colleges."

FRUIT PRODUCTION

C. P. Harley, Wenatchee, Wash.

"During the past 10 days I have been making some observations on the extent of injury to tree tissues resulting from our abnormally early cold spell," he wrote December 6th. "These observations are limited to the Wenatchee district proper and the smaller districts along the Wenatchee river.

"In general, it appears that the older bearing trees will suffer little permanent damage but the younger bearing trees and those not yet bearing have in many cases suffered severe injury and quite a percentage may succumb. This is especially true of apples and pears. Peaches, apricots and cherries apparently were more matured at the time of the freeze and do not show any injury at the present time. Pear trees show more injury at the buds than apples trees, although it is still questionable whether many of the pear buds are injured to the extent that they will not produce a good crop next year. In the apple varieties, Rome Beauty and Newtown seem to have suffered most. The injury consists of discoloration of the pith immediately in back of the bud and the tissues in the cluster bases. In the Rome Beauty variety the pith is sometimes black to a distance of half inch from the base of the bud. Newtowns show less depth of discoloration and it does not extend quite as far back of the bud.

"In no case of bearing trees have I noticed what I would consider as injury to the bud tissues themselves in apples. In the case of Anjou and Bartlett pears, however, there is a suspicion that some of the buds may be killed. Delicious, Jonathan and Winesap bearing trees show very little, if any, discoloration in the pith. Younger bearing trees and trees not yet in bearing show variations in injury ranging from none whatever to a complete blackening of all the tissues, including the bark around the trunk of the tree and terminal growths. New shoots from last year's top-worked trees have practically all been killed down to the cleft.

"Reports from the Okanogan districts indicate that the injury was greater than in this district, increasing as we go farther up the valley. Temperatures of zero degrees were reported from Oroville.

"Beginning on November 18th and continuing until December 2nd, the Wenatchee district experienced an extremely unusual climatic phenomenon. With the exception of November 23rd, the average minimum and maximum temperatures did not vary more than 5 degrees, including both day and night temperatures. On Saturday, November 23rd, the variation was 8 degrees. The minimum temperature during the period was 29 degrees, and the maximum 34 degrees, with the exception of the above mentioned date, when it rose to 37 degrees. Our thermograph charts at the Van Valkenburg ranch show almost a straight* line for temperatures."

*Note for W. R. Barger: See, Wenatchee weather is going straight! JAF

FRUIT PRODUCTION

Irrigation increases field in Eastern Apple orchards!

"During the 4 years of these tests the yield of Rome Beauty was increased more than 50 percent because of increased size of fruit, due to irrigation," says Technical Bulletin No. 491, "Soil Moisture and Irrigation Investigations in Eastern Apple Orchards," by J. R. Magness, E. S. Degman and J. R. Furr. "Oldenburg, on the other hand, when harvested in late July, showed little increase in yield or size of fruit due to irrigation."

This bulletin discusses the effects of soil-management practices on soil moisture and the value of irrigation under eastern orchard conditions. The discussion may come as something of a surprise to many, since in the central and eastern parts of the United States most of the apple orchards are without irrigation, the trees depending upon natural rainfall and the water-holding capacity of the soil for moisture supply throughout the growing season. Under these conditions, however, it is a matter of decided importance to know the amount of water available to the trees that can be held in the soil within the root zone of the tree. Periods of from 1 to 2 months when very little rainfall occurs during the growing season are of relatively frequent occurrence. Unless the moisture-holding capacity of the soil is sufficient to carry trees through such periods, poor growth and development of fruit will result.

The experiments reported on were based on test plots laid out under three soil conditions in a commercial apple orchard near Hancock, Md. Water for the experimental irrigation of these plots was available from a large spring and was delivered to the plots through a stationary spray pipe system. Water was applied to all irrigation plots by the overhead sprinkler system.

During 3 of the 4 seasons during which the tests were conducted, total rainfall from May 1 to October 31 was above normal, yet in each season apple trees in rather shallow shale soil showed reduced fruit-growth rate due to moisture shortage at some time during the season. The studies further indicate that the size of the fruit at the end of a season will be reduced in proportion to the length and duration of a drought. Following even a short period of reduced growth rate, the ultimate size of the fruit will be reduced accordingly.

The color of the fruit is dull and lifeless when the ripening season occurs while trees are suffering from lack of moisture, the bulletin reports, while moderate available moisture during the late-growing season has given maximum color, both in brightness and in area. Excessive moisture, on the other hand, tended to reduce the amount of color. The first measurable effect of reduced moisture supply on the functioning of apple trees is an earlier closing of the stomata. This occurs prior to a reduction in the growth rate of fruit.

FRUIT PRODUCTION

C. F. Kinman, Sacramento, Calif.

"Although we have had cold nights continuously for several weeks," he writes December 26, "nights with frost and occasional light freezes, the soil at a depth of a foot or so has remained warm enough to permit root growth and most of my experimental trees have put out some new root extensions.

"We have had nearly two months of dry weather. The only rains of consequence that we have had during the present supposedly rainy season occurred early in November. The orchard soils are very dry."

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ADMINISTRATIVE NOTE

Inventory The Lists of Inventorial Property are being mailed to the various field stations and offices during the third week in January. The Property Regulations provide that a physical check of all property of this nature must be made once a year. January 1 is the date assigned this Division. It is important that this actual check be made as soon as possible and the lists returned so that the complete tabulation for the Division can be made as required. Please assist us in this matter.

It may not seem so important to you, but restrictions and rules regarding these matters are becoming tighter each year. If some articles are listed which should not be charged to you, notations can be made. Also if articles are on hand or have been received which are not on the list, they should be added. The list sent is prepared in the Business Office for the convenience of the field employees in checking their property, but because the list may not include all articles for which the employee is accountable, that does not relieve him of responsibility. His list must be a complete one. If each does his share an authentic property report can be rendered without much difficulty. Articles lost or stolen must, of course, be reported on the proper Lost Certificates.

Incidentally, some of the employees appointed as members of Boards of Survey have been reporting LOST articles on such reports of the Board of Survey. Losses of articles must be reported on Loss Certificate forms. If you do not have this form, notify the Business Office and a supply will be mailed to you.

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DATE INVESTIGATIONS

Roy W. Nixon, Indio, Calif.

"Having already shown that pollen may affect the size and time of ripening of dates," he writes from the U. S. Experiment Date Garden, "experiments were carried out the past year for the second time on a rather large scale to determine the extent to which bunch-thinning affects size and time of ripening. The season's records are not quite complete as yet but previous findings are being fully confirmed. Not only is size increased in direct proportion to the amount of thinning, but light thinning or no thinning has markedly delayed ripening. Another important finding is that the larger dates resulting from the heavier thinning treatments are more susceptible to checking and blacknose, physiological troubles which our investigations have previously shown to be associated with the occasional occurrence of high humidity during the latter part of July and August. Moderate thinning, varied somewhat according to the vigor of the palm, is indicated as the best commercial procedure.

"Numerous tests were made this past year for the first time comparing various methods of thinning as between different bunches on the same date palm, and different strands on the same bunch. No definite statement as to the outcome can be made until the fruit has been studied in the laboratory, but it is believed that important information will be revealed as to the physiology of date thinning.

"At the suggestion of Dr. E. C. Auchter, tests were made during the year to determine the effect of freezing temperatures on the viability of date pollen. Pollen is stored up to 33 days at 8°F. before application gave good sets of fruit only slightly less than fresh pollen, the difference being of questionable significance. One lot of pollen is being held over in storage until later.

"Because of the marked retardation of the ripening of Deglet Noor dates resulting from the use of *Phoenix reclinata* pollen when applied with *P. dactylifera* pollens to different strands on the same bunch we have been anxious to try out this pollen on a large scale, but have heretofore not been able to get pollen in sufficient quantity and early enough to make the necessary tests. During the past year we secured enough pollen for all the flower clusters on one Deglet Noor palm and are checking it with another palm on which our *dactylifera* pollen causing latest ripening was used. The picking record is not quite complete, but it is evident that there has been only a very slight retardation of ripening from the *reclinata* pollen. Further tests on a still larger scale will have to be made before any conclusion can be reached as to the possibility of using *P. reclinata* on a commercial scale.

DATE INVESTIGATIONS

Dewey C. Moore, Indio, Calif.

"The date irrigation plots have about completed their first year. The different amounts of water applied in these preliminary studies during the year just closed varied from none to 20 acre feet per palm. Soil moisture samples were made just before each irrigation. No conclusions, of course, are to be drawn from this work as yet. There is apparently a marked difference in the size of the fruit on the palm that received no irrigation and that receiving 20 acre feet of water.

"A report from the California Date Growers' Association notes that the 1935 crop was one of the best for the Coachella Valley. The mean temperature for August was 90.2 degrees, which is 1.7 degrees below the normal. A total of .47 inch rainfall occurred during the month, with .36 inch falling August 14th. This caused some fungus spots on dates, especially where the fruit hung low, close to cover crops and irrigation water.

"The mean temperature for September was 87.3 degrees, which is 1.7 degrees above the normal. There was only a trace of rainfall during the month, which is .21 inch below the normal. The month was warm and dry, forcing the ripening of dates, causing a large amount of the first grade to drop back into the second grade, since the dates were dry and somewhat flabby in appearance.

"The month of October was also dry. Dates ripened very rapidly, with fair quality. In general the Autumn weather was mild and yielded gradually falling temperatures."

ADMINISTRATIVE NOTE

Faded Typewriter Ribbons. The Bureau Division of Accounts has asked that employees in the field be more careful about changing ribbons on their typewriters when such ribbons become badly worn. A number of vouchers have been received recently on which the typing was almost illegible. It is difficult to audit the vouchers when the typewriter ribbon is so worn that the characters are very faint or only partly printed, and mistakes are likely to result. Please, therefore, have the ribbon on your typewriter changed when it becomes worn out or the typing is very faint.

ADMINISTRATIVE NOTES

Hear Ye! Hear Ye! No, you are not in court, but you may be subpoenaed at any time, either on civil cases or those involving your official position, so a recent decision by the Comptroller General in connection with Weather Bureau employees will be interesting. He rules that Government employees subpoenaed to testify as witnesses for the Government are limited by section 850, Revised Statutes, to reimbursement of necessary expenses, but when subpoenaed to testify as witnesses other than for the Federal Government, not in their official capacity, they are entitled to the usual fees and expenses--time absent by reason thereof to be charged as annual leave, if any, or leave without pay in case annual leave is not available.

Where the value of their testimony in private litigation arises from their official capacity, they may be regarded as in a duty and pay status during the period of their necessary absence and in such cases they should collect the authorized witness fees and allowances for expenses of travel and subsistence, the amount thereof in excess of the amount of their actual expenses to be accounted for and deposited in the Treasury as miscellaneous receipts.

Employees called upon to testify as to weather conditions, for example, he states, with the production of official records, etc., are required to refuse the fee, except in the infrequent cases where the officer appears as an expert witness on leave without pay and with authority from the Bureau to accept an expert witness fee. The expense money, however, may be accepted as arranged for between the employee--witness and the party by whom he is summoned; but an account of the expenses must be submitted to the Bureau, not from the standpoint of Federal funds, since none are involved, but for general departmental knowledge and control of the practice. It sometimes happens that the officer serving the summons leaves the fee in cash with the person served and though requested to do so refuses to take it back, stating that he is required to make the payment and cannot do otherwise. In such cases, the deposit of the amount in the Treasury as miscellaneous receipts has seemed the best disposition.

Too, recent cases called to our attention indicate a lack of information concerning the procedure to be followed in the case of an employee, particularly a scientific or technical employee, subpoenaed to furnish information in court. It must be remembered that information gained by employees on official work is considered the confidential property of the Department, and therefore must not be divulged to any one in case of civil suits until or unless special permission is given by the Secretary. An order by the Acting Secretary of Agriculture, dated

ADMINISTRATIVE NOTES

February 15, 1933, states:

> "....they are prohibited from disclosing such information or data thus obtained, or giving out copies of any records thereof to private persons, or producing such records or copies thereof in court, or appearing as witnesses, expert or otherwise, in any litigation for the purpose of testifying as to any facts or knowledge received by them through such investigational or other work, except as may be directed by the Secretary of Agriculture. Whenever subpoenaes shall be served upon such employees, they will appear in court in answer thereto, and respectfully decline to testify to, or produce records pertaining to the matter referred to, as the confidential property of the United States Department of Agriculture, on the ground of their being prohibited therefrom by this order."

Especially note the last sentence of the quotation above. If you, or any employee under your supervision, are subpoenaed to give information on Department activities, you should immediately get in touch with Dr. Auchter, giving all details. The case will then be presented to the proper officials for further consideration.

Statistical Analysis Of Plot Experiment Data. Members of our staff who are conducting plot experiments will be interested in some recent publications that deal with the more practical phases of planning such experiments, particularly with a view to proper statistical analysis in the interpretation of the data obtained.

Foremost among these is a new book by R. A. Fisher, "The Design of Experiments," 252 pp, 1935. This is an amplification of the chapter on field experimental methods contained in the 1934 edition of the author's "Statistical Methods for Research Workers." In it statistical discussion is reduced to a minimum and concrete illustrations are given of successfully planned experimentation from the statistical point of view. A still more popular presentation is contained in "Principles and Practice of Field Experimentation," by J Wishart and H. G. Sanders, a 100 page publication of the Empire Cotton Growing Corporation (London), 1935. The first half is devoted to a discussion of principles, the second half to practical consideration. An article on "Error in Horticultural Experiments," by A. G. Strickland in the August, 1935, number of the Journal of the Department of Agriculture, Victoria, emphasizes and illustrates the detailed study of the variability of the plant materials used in controlled plot experiments with certain representative horticultural crops. Taken together, these publications serve well to give an introduction to or a review of recent developments in the practical statistical use of field plot data.

--- H. R. Fulton

ADMINISTRATIVE NOTES

Beltsville — Memorandum No. 648, December 10, 1935, has been amended to substitute the words "National Agricultural Research Center of the Department of Agriculture" for the words "Beltsville Research Center of the Department of Agriculture." The effect of the amendment is to change the usual designation from "Beltsville Research Center" to "National Agricultural Research Center."

Journal of Agricultural Research MSS. — Memorandum No. 866, December 14, 1935, from Mr. Richey, advises that manuscripts submitted for the Journal of Agricultural Research will in future go forward to the Editorial Committee of the Journal without the editing in the Bureau that has been given them in the past. If accepted by the Editorial Committee, the papers will then be returned to the Bureau for editing.

"Inasmuch as the date of reception is the date upon which manuscripts are received by the Editorial Committee of the Journal," Mr. Richey's memorandum points out, "this will provide for a considerably earlier date of reception. It also places upon us an additional obligation to see that manuscripts are in the best possible form when they are submitted. While the Editorial Committee will understand that manuscripts are to be edited before publication, undoubtedly they will be governed in their acceptance or rejection by the clarity of presentation in so far, at least, as this may obscure or make clear the purpose of the research and its results as reported."

Proposed State Legislation. — Memorandum No. 682, December 27, 1935, from the Office of the Secretary reads: "Pursuant to procedure approved by the President and the National Emergency Council, on December 17, hereafter the original and one copy of each request or recommendation concerning proposed State legislation, sought or proposed by any executive department, independent establishment or other Government agency (including Government-owned or Government-controlled corporations), or official thereof, will be submitted for clearance through the office of the National Emergency Council. This requirement will be observed by all officers and employees of the Department of Agriculture. All communications from the Department of Agriculture in relation to these matters will be prepared for the signature of the Secretary of Agriculture and addressed to the Executive Director of the National Emergency Council."

Dr. R. A. Fischer at Iowa Station. — A letter to Mr. Richey from Prof. E. R. Smith, Department of Mathematics, Iowa State College, Ames, Iowa, states that Dr. R. A. Fisher of the Galton Laboratory, University of London (and formerly of the Rothamsted Experiment Station) will be on the staff of the Iowa station during its summer session. Complete announcement of the lectures which he will give will be ready shortly. Any member of our staff interested should write to Professor Smith for the announcement.

Vol. 8 No. 2 January 15, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

Vol. VIII Washington, D. C., February 1, 1936 No. 3

Publications Two small boys halted before a brass plate fixed on a door. It read: CHIROPODIST. "Chirrupodist?" repeated one of the boys. "What does that mean." The other had an answer ready. "It means," he explained, "a fellow who teaches canaries to sing--chirrup, you know." Well, I'm striking out boldly in still another direction--becoming a cheerupodist!

And the first pleasure of this cheerupodist is to inform you that members of the Division's staff contributed 42 percent of the papers listed in the annual report of the Chief of the Bureau of Plant Industry as being prepared by Bureau workers during the fiscal year ended June 30, 1935. Of a total of 548 papers, we supplied 229. Of these, nearly 200 appeared in outside scientific, agricultural, and commercial publications, indicating that we get inexpensive as well as prompt publication! And we put out a score or so of mimeographed circulars.

"The problem is to send out to the people in each section information that they need in conducting their farm and home work," says Mr. M. S. Eisenhower in his annual report as Director of Information, discussing the regionalization of information. "We cannot render such service to the individual farm family, but we should make an effort to supply generally adapted information to the families of each agricultural region." Incidentally, as evidence of the Department's efforts in that direction, Mr. Eisenhower's report shows that 17,671,167 copies of Department publications were distributed free during the year, and that the Superintendent of Documents received $49,767.00 from the sale of Department bulletins and periodicals not available for free distribution.

As an indication of the recognition by scientists themselves of the desirability for the prompt and general dissemination of the results of research, Mr. Eisenhower quotes a resolution adopted by the Twelfth International Veterinary* Congress:

> Be it resolved: That the 12th International Veterinary Congress hereby embody in its deliberations a broad recognition of the importance of prompt announcement and wide distribution of significant results of sound research....

"A few years ago, science was not news," writes Chester H. Howell, Editor of the San Francisco Chronicle, in Editor and Publisher (December 21), "except when it blossomed out in some spectacular invention that we could ride on, eat or wear, or sell for money. Now science itself has become news and people have curiosity about it."

What worries Mr. Howell, however, is that much of the "scientific" news that finds its way to the printer is neither scientific nor news. The articles as printed, he contends, are quite likely not to discuss the supposed scientific discovery at all, but rather devote themselves to an outline of what somebody who knows nothing about the matter imagines might come out of the discoveries. "It is not too much to say," he adds, "that much of the incidental scientific news which comes over the wires or across our city desks would give the horrors to anyone who had had a course in general science in the freshman year in high school and still retained some fraction of that knowledge. There ought to be some one somewhere, along the line from the original interview with the scientist to the proofreader, who had at least an amateur and popular knowledge of what it was all about...."

It is exactly that sort of thing that is building up a reputation for the Department's publications. Editors feel that they can depend upon their accuracy. All of which emphasizes the fact that rather unusual care should be given to all manuscripts intended for publication, to make sure that they will uphold the Department's reputation. We have a model in our own Bureau!

"A conspicuous example of the kind of writing required to explain intricate scientific principles in language which laymen can understand appears this year in Farmers' Bulletin No. 1744, 'The What and How of Hybrid Corn,' by F. D. Richey, Chief of the Bureau of Plant Industry," says Mr. Eisenhower. He adds that there is no better way to indicate to laymen the real significance of results of scientific research than to take them behind the scenes, to interest them in the principles involved, to reveal interesting angles and tangles, to record some of the failures as well as the triumphs."

* Good old "horse sense!" JAF

A TANGIBLE INTANGIBLE THAT IS A PEACH!

A station agent, hearing a terrific racket outside, rushed to the platform to find a man sprawled among his baggage. "What's the matter," the agent inquired of a boy standing nearby; "was he trying to catch the train?" "He did catch it," said the boy; "but it got away."

That item in the January 15th News Letter pointing out the intangible service, so to speak, rendered by Milo N. Wood in warning growers against planting almonds under wrong conditions, almost got away from me and it was just luck that I managed to grab it later and use it--with the result that I have an item from Dr. Lee M. Hutchins that is not going to get away!

"The News Letter of January 15 carries interesting mention of a statement made by Milo N. Wood in which he warns almond growers against planting under wrong conditions," Dr. Hutchins writes on January 20, to Dr. Auchter, from the U. S. Peach Disease Field Laboratory at Fort Valley, Ga. "Our understanding of the cause of prolonged dormancy of the peach along the southern Atlantic seaboard has given us a similar opportunity to render a service to peach growers.

"Not long ago a prominent Fort Valley grower consulted me in regard to planting a large orchard near the Florida line, where he hoped to gain a decided advantage over central Georgia through earlier ripening of varieties. We were in a position to inform this grower that his undertaking would be a total failure because in the section where he proposed to plant, the accumulation of hours of cold at 45 degrees F. or below during the rest period is not sufficient to stimulate the trees to break dormancy promptly with the arrival of spring.

"During the fall of 1935, central Georgia peach orchards were favored with an unusually large accumulation of the necessary hours of cold. Whereas during October, November, and December of 1934 the accumulation was 490 hours, for the same period in 1935 the accumulation was approximately 650 hours.

"It is interesting to compare these figures with those of October, November, and December of 1931, when the accumulation was 291 hours; in the spring of 1932 central Georgia experienced the worst case of prolonged dormancy in 40 years, and the 1932 crop was almost a total failure on this account.

"A full thousand hours are required if all varieties are to behave normally in spring. The chances are excellent that the present deficiency will be made up by March 1."

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FRUIT PRODUCTION

C. P. Harley, Wenatchee, Wash.

"Some difficulty is being experienced just now in pruning," he writes January 2. "Many of the leaves still remain on the trees and it is quite difficult to see exactly what to do. Whenever we have been asked about this early winter pruning we have discouraged it of course, but in spite of this it is necessary in the case of certain growers of rather large orchards that they begin now in order to finish in time for the dormant spray. The difficulty of leaves on the trees has been somewhat relieved today due to rather high winds, but still certain varieties hold their leaves tenaciously. This is especially true of Rome Beauty and the younger trees which have not yet come into bearing."

Elmer Snyder, Fresno, Calif.

"This season grape seeds were collected from controlled crosses, selfed clusters, and open pollinated varieties," he writes. "These seeds have been cleaned and stratified and will be forced in the hothouse early in February. A grand total of 46,726 seeds were collected and stratified during the 1935 season.

"A continuation study was made of grape rootstocks growing in nematode-infested soil. To further the study of stocks resistant to nematode injury, stocks were hybridized and seeds collected for mass plantings to be later tested in nematode infested soil."

C. F. Kinman, Sacramento, Calif.

"Soil temperatures and moisture conditions have been favorable for root growth for several weeks," he reports under date of January 9, "and a fair growth has been noted with several types of fruit tree roots where the roots were recently pruned.

"Pear roots in observational pits which were installed several weeks ago have made no new extensions even at a depth of 4 feet where the soil temperature remains sufficiently high for root extension even during our periods of most extreme cold. Both last year and this pear roots have lived up to their reputation in slowness in starting new growth and for meager subsequent extensions. Examinations of surface cultivated soils revealed only a small amount of roots as compared to other fruit trees. Results of soil examinations and the slowness with which pruned roots start sending out new growth coincides with former experiences I have had which indicate to me that deep spring cultivation of pear orchards is not desirable."

FRUIT PRODUCTION

Strawberry Hybrids. "Ay, Jock, I read a fine story in a magazine th' other day," remarked Sandy MacPherson to his friend. "So ye' have been veesitin' the dentist, too, have ye, Sandy?" commented the friend. As it happened, I did not have to visit a dentist's office to read a very interesting account of the behavior of some of our new strawberry hybrids. A commercial nursery firm out in Maryland becomes quite enthusiastic in print concerning results secured from the Dorsett and Fairfax.

"These two varieties have shown us more real value than any other early strawberries we have seen in our 51 years' of experience," says the comment, entirely unasked for and yet not entirely unexpected! "In 1934 we stated that we believed the Dorsett and Fairfax strawberries afforded the greatest opportunity to cash in on something new and better than we had seen in all our experience.

"We followed our convictions and planted heavily of both varieties. While we acknowledge that the 1935 fruiting season was favorable, the facts are that in 1935 we picked more berries, better berries, obtained greater yield per acre, beat the market price more and made a greater net profit per acre and in total than in any year in our 51 years."

Apparently there was just one thing missing--disappointment!

"Dorsett and Fairfax at their best are so much better than any other early varieties," add these nurserymen, "that no grower can afford to pass them by without a thorough trial."

E. C. Hughes, Davis, Calif.

Writing from the University Farm on January 11, he says: "We have had nearly a week of cloudy and rainy weather which has brought our rainfall up to or beyond the normal.

"Due to the mild temperatures we have had, the almond buds are swelling and probably will be out in a week or two.

"Some trees of *Prunus mume* in our apricot collection are showing pink petals and will bloom in a day or two if the warm weather continues. None of the apricots show any appreciable swelling as yet."

FRUIT PRODUCTION

W. W. Aldrich, Medford, Oreg.

He writes January 6th that they have started the winter's job of chemical analysis.

"alcohol soluble and insoluble nitrogen determinations are now started. Dry weight and moisture content determinations of fruits and leaves are nearly completed. I was very much surprised to find that both in 1933 and 1935 (years that fruits of both light and heavy pruning were sampled) fruits from the heavily pruned plots were distinctly higher in moisture than fruits from the lightly pruned plots. The only exception to this was New Frequent plot in 1935, where both heavy and light pruning showed the same moisture content of the fruit."

He had written earlier; "The winter's job of pruning is being delayed, as usual, by most of the pear growers here until the milder weather of February. However, in the larger orchards pruning has been under way since early in December. The type of pruning being given about 800 acres of Anjou by one company has been influenced in part by the results of our pruning experiments. Although I made no recommendations, the manager has followed my work closely and has utilized results he noted....

"The low yield of Bartlett with 'heavy' pruning in 1934 and 1935 emphasized the seriousness of reducing the number of blossoming points by repeated heavy pruning, while the high yield of the 'no pruning' in 1935 indicated the capacity of Bartlett to set and hold a large crop if sufficient fruit buds were left on the tree. This winter the company is following a lighter pruning than ever before, in spite of the fact that the fruit on the more lightly pruned trees had a rougher surface than fruit on the heavily pruned trees.

"For Anjou, the two years' results in the Clancy plots are not particularly important. However, cork is frequently serious on Anjou in this orchard, and 'heavy' pruning in these plots showed 35 percent cork this season, while 'no pruning' and 'light' pruning showed 4 and 5 percent cork, respectively...

"When the lower market value of the larger fruit sizes, resulting from the heavier pruning, is calculated, it is almost certain that the 'light' pruning will show the greater total value. From these results one company has adopted a lighter pruning with the hope of reducing cork and reducing also the amount of large sized fruit without at the same time materially reducing total yields."

FRUIT AND VEGETABLE HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash.

"Observations made during the last week in November indicated that apples in boxes which were stacked together and covered during the freeze of October 28 to November 1 and left until thawed before being moved to storage had very much less injury than fruit which was moved while frozen but before being subjected to the more severe part of the cold period.

"A careful survey was made by inspectors of the local State horticultural office covering various lots of Rome Beauty, Stayman and Winesap varieties which were moved while frozen and which were left in the orchard. The average salvage of those moved while frozen was 21 percent, while those that were left in the orchard until thawed had an average of 72.4 percent apparently undamaged fruit.

"These observations are general and are subject to great variability in exposure. Many of those which were moved while frozen may not have been stacked and covered in the orchard, whereas many of those left in the orchard presumably had some protection.

"Of the apples which were thawed without apparent injury, many are now showing advanced ripening, which is forcing early consumption."

NO, NO, TEN THOUSAND TIMES NO! NO FREE SEED.

The beginning of each new year marks also the beginning of a flow of requests to the Department for free seed. Prior to 1923 there was an annual appropriation to provide for free seeds to be distributed through Members of Congress. At that time, however, it was finally decided that it was rather unfair to commercial seedsmen for Uncle Sam to be handing out free of charge the type of seed they sold, for the Congressional seed distributions included for the most part only commercial garden seed such as may be purchased from any good seed house.

For thirteen years, then, there has been no distribution by the Department of "free seeds," but hope appears to spring eternal in the applicant's breast for each year as spring approaches thousands of requests pour in from farms, suburbs, and penthouses. Perhaps ten thousand negatives appear to constitute an affirmative.

You get what I mean--the Department has no free seed for distribution; and it has no seeds or plants for sale either. Please break this sad news as gently as possible to your friends, acquaintances and correspondents--if any.

FRUIT DISEASES

M. A. Smith, Springfield, Mo.

"The reports of the 1935 apple scab and pear leaf spot spray experiments were recently completed," he writes from the Ozark Fruit Disease Laboratory on January 1. "When copper phosphate was used in the pre-bloom, followed by liquid lime sulphur in the post-bloom applications, excellent control of apple scab was obtained. A minimum of spray injury resulted when this schedule was followed.

"Good control of the pear leaf spot fungus, Fabraea maculata, resulted from the use of the copper phosphate mixture with Areskap added. No spray injury occurred."

TEARS IN THEIR EYES

Onions bring tears to the eyes because of the powerful volatile oil they contain, says one of our Department press releases, but their "strength" depend somewhat upon when and where they are grown.

"Onions grown during the winter, spring, and early summer have a milder odor than those of the same variety grown later in the summer," says W. R. Beattie of our Division. "Hot growing temperatures enable the onion to produce more of the tear-producing oil than cooler temperatures."

Discovery that tears from onions are caused by a volatile oil is accredited to a German chemist. He distilled more than a ton of onions to obtain less than one-tenth of a pint of pure oil. A drop of this oil is said to be enough to make the odor of onions noticeable throughout several large buildings.

One variety of Italian red onion is almost odorless when grown in its native Italy, but decidedly stronger when grown in this country. The most pungent varieties grown in the United States are the Red Creole, White Portugal, Australian Brown, and Ebenezer, and in the mildest group are the Italian Red and sweet Spanish types.

It has been suggested, in this connection, that if one has a keen craving for onions but is held in check by dread of the resulting breath odor, his problem can be solved by eating the onions at expensive hotels only. The idea is, of course, than when he gets his bill for the onion dish it will take his breath away!

FRUIT DISEASES

John C. Dunegan, Fayetteville, Ark.

"The weather this week has been unusually mild, with warm days and only moderately cool nights," he writes under date of January 18th. "The high temperature reading on January 12 almost exceeded the record of high temperatures for this date in past years. However, the temperature dropped rapidly the afternoon of January 17, and we are again in the grip of winter weather. This type of weather conditions is a feature of our winters, and the high temperatures, lasting for a week or more, followed by very sudden drops, have been very conducive to winter injury in past years and it appears that this winter is to be no exception.

"A letter received during the week from Dr. T. Harrison of the Hawkesbury Agricultural College, Richmond, New South Wales, reports the discovery of the bacterial spot disease of plums in New South Wales. The following day I received a letter from Dr. H. Wormald of the East Malling Research Station, Kent, England, requesting cultures of Bacterium pruni isolated from English Morello cherry, to compare with cultures he has isolated from English Morello cherries in England."

ADMINISTRATIVE NOTES

Radio and Telegrams — From time to time we have urged that you utilize the Army and Navy radio stations in transmitting messages. We are now in receipt of a notice from the Comptroller General reading as follows:

> "The attention of officers and employees of the Federal Government should be directed to the fact that radiotelegrams may be transmitted between many of the larger cities of the United States more cheaply than telegrams."

In order that there may be full compliance with the well-established principle of utilizing the most economical service available, which is for general application and observance by all who are authorized to incur expenses chargeable to public funds, the Comptroller General urges in this notice that care be exercised to see that messages of this type are transmitted by the most economical method. Previous notices relative to the use of radiograms have been published in the NEWS LETTER from time to time, but this is the first warning from the Comptroller General--a warning that probably means a failure to observe instruction regarding the most economical means of sending such messages may result in suspensions in your accounts. Station superintendents and field employees in general, should take steps to ascertain whether radio service is available. Some of our men, of course, have been taking advantage of the Army and Navy radio service for sometime.

NUT PRODUCTION AND DISEASES

Paul W. Miller, Corvallis, Oreg.

"The catkins on early varieties of filberts such as the White Aveline and Barcelona are elongating and a few are shedding pollen," he writes January 11th. "The leaf buds are slightly swollen but none have opened sufficiently to expose the tips of the leaves.

"Intermittent rains have fallen practically every day this week. Since the first of January, almost 5 inches of rain have fallen at Corvallis, Oreg."

He had written January 4th: "According to a recent review of the weather for 1935 by the Government meteorologist at Portland, Oreg. several all-time records were broken during the year just past. The mean temperature for the year at Portland was 53.8° or 0.7 of a degree above normal. The hottest day was on July 13, when the mercury rose to an all-time record of 105°. The coldest day was January 20, when the mercury slipped to 12 above zero. The mercury reached or passed the 100 mark three times in the summer, also an all-time record. Precipitation measured 29.19 inches, a deficiency of 12.43 inches. It was the third dryest year in the precipitation records. The wettest month was December with 5.99 inches and the dryest August with .10 of an inch. Weather records revealed also that 1935 was the thirteenth consecutive year in which the mean temperature has been above normal."

NUT PRODUCTION

B. G. Sitton, Shreveport, La.

Writing from the U.S. Pecan Field Station on January 11th, he says: "During the week we completed the cracking to determine the filling of the different varieties from the Station. There was considerable variation in quality of pecans and the percentage of filling, but in general this variation was in line with previous experiments. It was noted, however, that most of the thin-shelled varieties were badly damaged by stink bug.

"Considerable Crotoloria spectabilis was grown in a portion of the variety planting. This species of crotolora has been considered in the past as a non-host plant for the stink bug, but there is no doubt in our minds that the stink bug did breed on crotoloria this year as indicated by the fact that all stages of the nymph were found on this plant during the growing season. Last year we also found all stages of the numph on the same species of plant."

NUT PRODUCTION

Milo N. Wood, Sacramento, Calif.

"From what little time I have given to the study of almond orchards recently," he writes for the two weeks ending December 28, "it appears that some of them have been neglected badly this year. This seems to be due partly to the fact that these particular orchards produced so lightly this year that the growers did not feel that they would be warranted in giving them the necessary attention. However, it seems that some of them may not come through with a good crop next year either owing to this neglect.

"In some sections collar and crown rot has developed. To date this appears to be a pathological trouble, although no one seems to be able to isolate the organisms at this time. As to how serious this trouble may be depends upon the extent of its spreading to various orchards.

"To date this has been an exceedingly dry year and some of the non-irrigated orchards are showing the effects of drought. At this time, however, a heavy rain has set in which if it continues may be of great benefit to the almond orchards."

ADMINISTRATIVE NOTE

Repairs and Identifications

The station agent in a small town dropped a box containing a white rabbit. It smashed and the rabbit escaped, making for the woods nearby. "Aren't you going to try to catch it?" asked a bystander as the agent made no move. "Naw, "he responded. "He'll be back. He don't know where he's going. I've got his address tag."

Apparently some of our workers are about as optimistic as this particular agent. At least we have a letter from a firm advising us that they have received from the "Horticultural Department, Bureau of Plant Industry," with no other identification marks, a microtome knife, 120 mm blade, in case. The firm wants to know where it is to be sent, what is to be done with it, and to whom the charges are to be billed. Did you or you, or you send such a microtome knife to be repaired or sharpened?

As the Business Office has continually urged, never send out such items without definite marks of identification both in and on the package. A letter should be sent along with any such shipment--and if practicable a carbon of it wrapped with the article sent. In case it is something to be repaired, it is also necessary that you make it clear to the dealer that you are asking for an estimate only and that no work is to be done until an official order covering it is received from the Department.

ADMINISTRATIVE NOTES

Travel By Air. The matter of time saved in travel by air over travel by rail--for spending at headquarters or elsewhere--involves too many elements of uncertainty to serve alone as a determining factor justifying payment of the extra cost involved, says Comptroller General McCarl in a decision of November 12, 1935.

"The administrative head of a large governmental unit is not necessarily idle because not at his desk," he points out, "and there are those who make splendid use, in the public interest, of the opportunity for study and deliberation afforded by the convenience of present-day travel by rail, but however that may be it is well established that appropriations are not legally available for payment of the extra cost involved in travel by air over travel by rail unless the particular travel was made necessary by an unexpected occurrence, emergent in character, or was otherwise required in the public interest."

In this particular instance, the traveler had to pay $70.00, the difference between the air and rail rates, himself, as the mere fact that it saved time was not considered by the Auditor sufficient justification for the extra expense. Consider carefully, therefore, the emergency circumstances, etc. before choosing airplane travel in preference to rail transportation.

Foreign Travel. In a decision of November 6th, the Comptroller General ruled that travel is authorized in reporting to an assigned post in a foreign country with temporary duty en route in another country, via an American vessel to temporary duty station and a foreign vessel from a port in that country to permanent duty station, where the all-American route would require such travel by train and vessel as to involve greater time, greater expense, and render impossible the performance of temporary duty en route. This is cited for your information, but the only safe method is to handle all matters concerning foreign travel, if any, through the Washington office, thus getting definite instructions before acting.

Roundtrip Tickets. Another decision, November 6, 1935, rules that roundtrip railroad tickets purchased on transportation requests may be used by one Government employee on the going trip and another Government employee on the return trip where the formal assent of the railroad company is secured to the waiver of the tariff restriction of nontransferability. If such a question comes up, it is probable that the local ticket agent will be able to secure the necessary waiver for you.

ADMINISTRATIVE NOTES

Inventory — The field lists of inventorial property have now been sent out. RIGHT NOW is the best time to attend to this annual check-up. If you have not checked and returned your list PLEASE DO SO AT ONCE.

Exceptions and additions should be noted on the lists. Any pertinent data should also be given. It is practically impossible for us to have too much information on our records. And don't forget that we need serial numbers, if any, on equipment.

How's your Boiler? — The Business Office has been asked for certain information in regard to boiler plants. Many boilers at our field stations have been on hand for years. Others have been installed more recently, but the installation has been on emergency or PWA funds so that our records are not complete in many cases. If you have a boiler plant of any kind that operates at 15 pounds pressure or more, please notify the Business Office at once.

Contracts for Electric Current — Don't be shocked, but there is no legal objection to modification of a contract for furnishing electric current to the Government by the substitution of rates to be charged thereunder, if the application of the substituted rates results in a saving to the Government of any considerable amount. These are the words of the Comptroller General in a ruling of October 21, 1935, just received--A-66231.

The general rule of course is that a contract with the United States may not be modified except in the Government's interest. The ruling in question was made at the request of the Marine Corps which had an opportunity to take advantage of a new and optional schedule which while not superseding the schedule included in its contract could be substituted and would result, as tests had determined, in a considerable saving to the Government. As stated, the Comptroller General ruled that the substitution could be made legally.

The reason we are bringing the matter to your attention is to emphasize the importance of having our workers notify the Business Office whenever they learn of a reduction in electric current, gas, water, telephone or other rates that could be taken advantage of by the Government. You see, supplemental contracts MUST be executed before payments can be made at different rates than those specified in the original agreement. As soon as we have information about the better rates, we can proceed to have necessary supplemental contract prepared.

Vol. 8 No. 3 February 1, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

This NEWS LETTER is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects,

Vol. VIII Washington, D.C., February 15, 1936 No. 4

Seminar at Beltsville

On January 21, 1936, seminar meetings of the staff at Beltsville were inaugurated with a talk by Dr. Auchter. He emphasized particularly the splendid opportunities before the group of horticulturist and plant pathologists now stationed at Beltsville, Md., for a constructive and coordinated attack on horticultural and pathological problems. Among the staff, we have men trained in many of the different phases of botanical science, including cytology, genetics, physiology, pathology, etc. The close and friendly cooperation of such a group of workers should make for great progress at that station.

On January 28, the staff was addressed by Mr. F. D. Richey, Chief of the Bureau of Plant Industry, on the statistical viewpoint in research, and related topics. He presented particularly his point of view in the value of statistics in agricultural research. He pointed out that statistics were perhaps of even more value in determining the proper layout for an experiment than in analyzing the results of an experiment after its completion. He also emphasized the greater value of having experiments distributed under several soil and climatic conditions rather than developing a great number of replications under one set of conditions, if information of widest application and consequent benefit to agriculture is to be developed. The discussion, coupled with informal questions and discussions among the group, was of much interest and value to the staff.

These seminars will be held weekly until field work begins to interfere seriously, probably until about April 1st.

FRUIT PRODUCTION

W. W. Aldrich, Medford, Oreg.

"The large size of the fruit this past season (most crops of Anjou and Bosc 'peaked' at a 110) and the difficulty selling such large fruit have caused shippers and some growers to contemplate omitting the late summer irrigation in 1936, with the object of checking fruit growth," he writes January 20th. "I feel this plan is undesirable. Cool weather in May and June of 1935, and perhaps other conditions, favored rapid early fruit growth, large leaf and general tree vigor with the result that in 1935 the fruit was larger than usual. Another season might favor a much slower fruit growth.

"Too, our experimental results show that when Anjou trees are allowed to suffer for water during the three or four weeks preceding harvest the fruit has a slightly shorter storage life and the trees have a lower vigor the following spring. As far as any one grower is concerned, I believe that checking fruit growth will result in a loss in net return, because in spite of the lower market price per box for the larger sizes, they usually bring a greater net return per fruit. This last conclusion is not realized by some shippers; so I have studied the matter in considerable detail."

Commenting, then, on a careful study made of market price differentials due to size of the Anjou, made on the New York auction during the months of January, February and March, 1932, 1933 and 1934, he says: "My figures show that growers received more per fruit for large than for small sizes. In fact, the largest fruit netted the grower the greatest amount per fruit. Thus, once the number of pears per tree was established for the grower by the set of fruit, it was to the grower's advantage to grow as large a fruit as possible. The solution to the marketing problem of disposing of large sizes is, therefore, not to slow down fruit growth but to set more fruit per tree. This conclusion indicates that the problem of increasing the set of fruit is now perhaps the most important one in the Rogue River valley.

"The importance of my figures for Anjou justify a similar study of Bosc, which will be made shortly. Since shippers are chiefly concerned with the difficulty in moving large sizes, they are in general favor of less irrigation, to give smaller fruit, and will undoubtedly recommend it to many growers. However, I am talking this matter over with several shippers, for I fear a general recommendation of reducing irrigation to check fruit size would not only reduce the next returns to the growers, but might lead to serious devitalization of the trees."

In making this Anjou study, records were made from the daily reports of the New York auctions of price of each size of each carlot offered each day during the three months by each of the three largest shippers in the Rogue River valley.

NUT PRODUCTION

Geo. P. Hoffmann, Meridian, Miss.

His report of January 4th refers quite casually to the sort of thing all good station superintendents are doing constantly--to produce indirect dividends for the taxpayers!

"From the land that is being cleared a nice lot of stock logs were salvaged," he writes, "these being delivered to a local saw mill to be sawed into framing material, which material might later be used in the construction of a machinery shed and other buildings as might be decided upon. The cost per thousand for hauling the logs to the mill and returning the lumber to the Station was $10.00. Because of congested conditions at the two dry kilns in Meridian, it was not possible to kiln dry this lumber; consequently the lumber has been carefully stacked for air drying.

"Because of the price being prohibitive and for the further reason of the quality not being the best, we cut from Station land the 42 telephone poles necessary for constructing our line from the Station entrance to Marion, Miss. These poles were cut and skinned during the course of our land clearing, delivered to the creosote plant and treated. The poles were given standard treatment and were inspected and classed as high grade no. 1, class 9, C.P. Safeguarding against poor penetration, cores were drawn from the poles and it was found that the penetration reached a depth of 2 to 2-1/2 inches--fully meeting the requirements of the Western Electric Company inspector."

He had written the middle of December: "Unfavorable growing weather, very cold, has checked the growth of our cover crop of winter peas and vetch. It is interesting to observe that heavy, or above the normal rate of seeding has withstood the cold much better than lighter or normal seeding. However, experience and observations with a similar crop last winter would indicate that 17-1/2 pounds each of peas and vetch sown in combination per acre is sufficient to give good and heavy grund coverage by spring. Also, the plant spread on the lighter seeding is more satisfactory.

"A digging was made on December 11th of a portion of the plots of the sweetpotatoes in the delayed digging experiment. Samples of these, along with samples of those from the regular storage tests, were taken and sent to the Laurel Starch Plant for starch analysis.

"Replacement trees were ordered from the nurseries which had agreed to replace pecan trees lost during the 1935 season due to winter injury, other injuries, or weaknesses tracesable to the nurseries."

NUT PRODUCTION

C. E. Schuster, Corvallis, Oreg.

"The early part of the month saw steady, heavy rains," he writes January 25th. "The temperature has been mild. As a consequence, the filberts are blooming heavily and steadily so that the blooming season for filberts will shortly be over. From the bloom standpoint and the weather conditions, the crop for the coming season should be by far the largest ever harvested.

"On the other hand, the walnut crop will undoubtedly be short, as many orchards, especially in the lowlands, show an extremely heavy loss of fruiting wood and fruit buds. The district involved in the winter killing seems to be widening, as the reports come in. Quite universally, trees up to 8 or 9 years of age seem to be the most subject to damage. Some growers feel that their trees are completely girdled. In other cases they say that the injury is confined practically altogether to the north side of the tree. This seems to be typically true this year.

"While the winter injury generally noted before, except in one or two cases, has been on the south and southwest side of the trees, the heaviest and the first damage noted this year was on the north side towards the prevailing wind during the cold weather. It is still quite evident that the walnuts suffered much more than any others. Peaches, which are considered among the tenderest trees, suffered no apparent damage at all in most places.

"The cold weather in October and the first of November completely stopped the growth of cover crops. Since then the weather, while mild, has not been warm enough to encourage much growth, so we are entering the month of February with a very poor, light cover crop in all the orchards."

C. L. Smith, Austin, Tex.

A trip was made to Brownwood during the week ending January 18th to check up on trees to be replaced, as well as to map plans for future plantings and experimental work. The trip was extended to Wolfe's nursery at Stephenville and Gray's nursery at Arlington, where cooperative experimental work was checked. At Austin, analytical work on pecan roots and the specific gravity studies were continued.

Milo N. Wood, Sacramento, Calif.

"Almonds are bursting into bloom rapidly, but only the early ones are now in full bloom," he writes January 25th. "The blooming season is much earlier than was the case last year."

NUT PRODUCTION AND DISEASES

Paul W. Miller, Corvallis, Oreg.

"Further reports of damage from the unseasonably early freeze which occurred during the latter part of October, 1935, are being received from the vicinity of Portland and McMinnville, respectively," he writes for the week ending January 25th. "Young trees up to 10 years of age are said to be more seriously damaged than older trees. Better cared for plantings on the best land are reported to be more severely damaged than poorly cared for orchards and those on poor land. Apparently the degree of maturation of the tissues at the time of the freeze is an important factor in determining the degree of injury, the best cared for orchards or those on the best land, being less mature at the time of the freeze than those on poor land or those which had been poorly cared for."

He had written January 18th: "Many catkins on the Barcelona variety of filbert are now shedding pollen. About 5 percent of the pistillate flowers are receptive. A few catkins on the White Aveline and Daviana varieties, which are pollenizers for the Barcelona, are also shedding pollen. The Barcelona variety will probably be in full bloom by the last of the coming week, provided the temperature does not fall any lower.

"The climate in western Oregon during the week just past has been characterized by cloudy and rainy weather. We have had between 10 and 11 inches of rain at Corvallis since the first of January. The normal for this month is 6.6 inches. The heavy rainfall which has occurred has caused many rivers to overflow their banks, creating flood conditions."

U. S. Pecan Field Station, Albany, Ga.

Dr. H. L. Crane visited the station the middle of January, observing work on the different experimental plots with Mr. Hardy, and visiting the disease-control projects with Mr. Cole.

The station staff, with the earnest cooperation of the local weather officials, was able to provide a brand of weather that had Dr. Crane well satisfied to extend his visit a trifle--considering what he must have known he was missing by being absent from his Beltsville, Md. headquarters during the week--the beginning of one of the longest sustained cold periods there for many years.

The Albany weather, according to reports, was as pleasant as any during the winter though it did change rather abruptly on the 18th, producing some 3 inches of rain and rather raising the wind before Monday, January 20th. However, no serious storm injury occurred--to trees or visitors!

FRUIT DISEASES

H. F. Bergman, Amherst, Mass.

Writing from the Cranberry Disease Field Laboratory on February 1, he says "The analysis and tabulation of data from spraying and dusting experiments for the past two summers was completed last Monday. Since then I have been working on copper determinations in soil and vines from plots heavily treated with copper sulfate and in looking up references on methods of copper and mercury determination.

"Most of the copper in vines from plots heavily treated with copper sulfate is localized in the old stems, very little of it reaching new stems, leaves or fruits. A study of stems by methods of chemical microscopy will be required to obtain further particulars as to localization of copper."

He had written January 25th: "I have continued this week on the analysis and tabulation of data from dusting and spraying experiments of the past two seasons. There is now, I think, only one more series of data to be gone over.

"Part of the time has been used in analytical work on copper and mercury determination. We tried two methods for the determination of mercury, but neither method gave satisfactory results. I have also begun testing some other analytical methods for copper.

"The price of cranberries, I understand, has dropped to between $8.00 and $9.00 per barrel after having sold for from $15.00 to $18.00 before Christmas. I do not know how many late berries are still on hand, but if there are many it will be a serious matter for growers who are holding them."

Lee M. Hutchins, Fort Valley, Ga.

Writing from the U. S. Peach Disease Field Laboratory on January 27, he states that the cold wave that gripped the North during the week dipped well into Georgia. "At Fort Valley, we experienced temperatures below freezing every day but one, and the low point was 19°F. the morning of January 24th.

"Dr. F. E. Gardner was with us on January 23-26, during which time we examined a rather extensive series of peach and apricot nursery trees for susceptibility or resistance of different rootstocks to nematodes."

ADMINISTRATIVE NOTES

Annual Reports The young lady at the concert was trying to show her keen interest in all that was going on. "What is that book the conductor keeps looking at?" she asked her escort. "That's the score of the overture," he explained. "Oh, really!" she exclaimed. "And who is winning?"

In a way, at about this time each year, that is what Dr. Auchter wants to know--hence the sending out of the memorandum of January 20, requesting the annual reports of progress. This is just a reminder that the reports must be in his hands by April 1. We are not forgetting the significance of the date, but don't fool yourself about the matter. After all, you may be winning: but what if nobody knows anything about it?

The period to be covered by the reports is the fiscal year--July 1, 1935 to June 30, 1936, so that the months from April to June will deal with projected activities. The reports should not rehearse accomplishments prior to July 1, 1935, beyond what is necessary to give a proper background, and should be fully developed, informing statements as to the work done, where it was done, and what was accomplished.

Perhaps you can make a better report if you keep in mind one of the uses of this material; Put yourself in the position of the Chief of Bureau before the Director of the Budget or a Committee of Congress, fighting for the financial support necessary to continue your investigations. Then supply us with the sort of information you believe will justify your work.

Too, the annual report of the Chief of Bureau is made up of brief paragraphs concerning the more conspicuous accomplishments of the year in the work of the Bureau. So, in addition to the regular progress report mentioned, each project leader is asked to prepare paragraphs relating to his own work in the way he would like to have them appear in the Chief of Bureau's report, should they be selected for that purpose; or at least to indicate what items in his progress report he considers worthy of recognition, with a view to the paragraphs being shaped up here at Washington.

As the Memorandum of January 20th points out, we need, too, a list of new publications issued in Department series during the fiscal year; bulletins that have been rather extensively revised for reprinting; articles appearing in outside publications; manuscripts submitted for publication but not yet in print but likely to be by June 30; and manuscripts in the course of preparation on subjects for which the research work has been completed.

ADMINISTRATIVE NOTES

Alterations in Leased quarters — A decision by the Comptroller General, No. A-65357, of December 12, 1935, emphasizes the importance of care in making additions or alterations in leased quarters, especially in connection with such items as electric lighting equipment and similar fixtures where light, gas, water, electric or similar services are a part of the lease. The point is that if the lease provides for such services, it includes also the upkeep of the equipment to guarantee satisfactory service.

The decision in question was in connection with a lease which provided that the Government, during the occupancy of the premises, should be furnished "water, light, heat, toilet, janitor and elevator service." At the time the lease was executed it was believed that the lighting, etc. was satisfactory, but later it was found that additional equipment was desirable and the Government officials proposed to furnish this additional equipment. The Comptroller's ruling is that the obligation to furnish light service, etc. carries with it not only the contract to furnish current, etc. but it not limited to such equipment and apparatus as were in use in the office when rented but extends also to such as may be reasonably needed during the life of the lease in connection with the purpose for which the space was rented.

A good many leases include a proviso that the Government shall have the right to make alterations, attach fixtures, etc., but this usually hinges upon the permanency of the installations, so it is necessary to make sure before going ahead--meaning that if you contemplate any such alterations in leased quarters you should refer the matter to the Business Office of recommendations before incurring any liabilities.

Travel — In another ruling it was declared that employees performing official travel may not be reimbursed for cash payments made in excess of minimum first class steamship fares notwithstanding it is alleged the minimum first class accommodations were used by orientals only. This was in connection with travel in Hawaii.

Another point brought out in connection with the same travel is that employees authorized to use their personally owned automobiles on a mileage basis for official travel, are not entitled to reimbursement for freight charges for transportation of their automobiles for that portion of the travel performed by boat, the mileage being in lieu of all transportation expenses. "The mileage allowance authorized by the act of February 14, 1931, 46 Stat. 1103, for the use of an employee's own automobile is in lieu of all expenses of transportation and precludes any allowance for ferry fares, etc. in addition to mileage. The mileage is to be computed over the distance actually traveled, including the distance traveled by ferries, even though such distance is not recorded upon the speedometer of the automobile." (A-64532, October 28, 1935).

ADMINISTRATIVE NOTES

Airplane Travel. The use of airplanes for official transportation, says the Comptroller General in Decision A-66038, in cases other than emergency or exigency from the Government standpoint, is authorized only when the cost thereof to the Government does not exceed the cost by rail, plus Pullman, where the travel is such that Pullman charges would have been authorized.

The interesting point in this ruling is that pullman service has been discontinued between certain points in question and the Government office wanted to know if its travelors could still use airplane figuring the cost as though pullman were still available. The Comptroller seems to take the position that where no pullman charges would have been authorized (there being no pullman!) the cost of pullman service cannot be figured in arriving at the cost of travel; hence to use airplanes for this particular trip means that their cost must not exceed the cost by rail alone. (See par. 8, Standardized Travel Regulations).

You can decide for yourself, then, whether this decision puts you up in the air or not! But it's no tougher than figuring the pullman fare where there is no pullman.

"About"--or "More or Less"? Have you ever stopped to think just what "about" means; or "more or less?" Well, you don't need to stop or to think--the Comptroller General has decided that, too. He says that "about" or "more or less" when modifying a quantity of material to be delivered on an order or contract merely provide against accidental variation; they do not mean that a dealer can intentionally increase or decrease the amount to be furnished.

In the case in connection with which the decision was rendered the price of material had increased after the bid was submitted and award made and the contractor tried to cut his loss by reducing the amount to be delivered by 10 percent. This it was pointed out, was an intentional reduction, whereas the word "about" as used in the contract referred to accidental increases or decreases due to conditions of loading, shipping, or other causes beyond control.

Liquidated Damages. It has been definitely ruled, also, that liquidated damages must be deducted if the bids stipulated a period of time for completion of a job with a rate of liquidated damages after such date in case job is not completed on time. In keeping with this, if you prepare specifications for bids that are issued on forms calling for contract and bond, it will be impossible to waive the liquidated damages clause even though the low bidder happens to be a reputable and dependable dealer or contractor.

ADMINISTRATIVE NOTES

Repairs, Construction, Alterations. As you know, the Appropriation Act providing funds for the Bureau contains a proviso that the cost of any building to be erected under these funds shall not exceed $1500.00. In Memorandum No. 870, dated January 24, 1936, this proviso is supplemented by instructions that hereafter no construction or repairs will be undertaken where the cost exceeds $500.00 on any one building without first securing approval by the Chief of Bureau.

This means that if you are contemplating any such repairs, construction or alterations, to cost $500 or more, it will be necessary for us to secure the approval of the Chief of Bureau before the work can be started. The request for this approval will be prepared here on the basis of the information you furnish. When contemplating such work, therefore, send us immediately a statement showing station and location where the work is to be done, the nature and purpose of the construction, and an estimate of the cost. The estimated cost should be itemized to show cost of materials, outside labor, and station labor separately. Be sure to state whether you plan to ask for bids for the complete job, or whether you intend to purchase the materials only and hire labor for construction. A plan and description of the proposed construction should be attached to your statement.

Unfair Competition. In the matter of making sure that specifications and invitations for bids provide for absolutely fair and open competition, attention is directed to a recent decision of the Comptroller General to the effect that a clause stipulating short time for delivery cannot be employed as a qualification in the acceptance of a higher bid when the equipment or supplies to be purchased are of such a nature that they are not usually carried in stock by bidders or manufacturers in the quantities requested. The case in point concerned the issuance of bids for 456 "pick-up" trucks, the time for delivery being fixed at 15 days, with penalty for delays. As a general rule, most manufacturers of automobiles would not have as many as 456 of this type car coming off their assembly line in the time specified, therefore the qualification operates to shut off competition.

Disposition of Surplus Property. The Procurement Division of the Treasury Department calls attention to the regulations governing the recording, care and disposal of property, and points out that it is compulsory when we have usable equipment no longer needed at one of our stations we should arrange to transfer it to other Divisions or Departments where it could be used to advantage. If you have any such equipment, send us a list, stating condition, etc. and estimated value, and we will see that it is called to the attention of proper officials and will advise you promptly what disposition to make of the items.

ADMINISTRATIVE NOTE*

Distributing Publications. Bureau of Plant Industry Memorandum No. 681, November 7, 1932, directs that all orders for publications be sent through the Bureau's Publications Office. Orders drawn in our Division, of course, go to Mr. Gilbert first, for checking and forwarding to Mr. Pickens. This procedure was found necessary to make sure that orders were correctly prepared to be handled with a minimum of time and labor. The law (U. S. Code, Title 44, Sec. 95) provides that the work of addressing, wrapping, mailing and otherwise dispatching publications for public distribution be handled at the Government Printing Office. We have a working agreement with the Superintendent of Documents authorizing us to mail publications direct with certain pertinent correspondence, etc., but ordinarily bulletins are sent from the Government Printing Office, orders going first to Mr. Gilbert.

Where less than 8 publications are ordered, a suitable franked manila envelope is used, the series, number of copies, and initials of person ordering being placed on the inside flap. In such cases no order or addressed frank is needed--the envelope serves as the order. When 8 or more publications are to be sent, use order Form 75 (white) for Farmers' Bulletins and Leaflets, and Form 74 (blue) for all other publications. Pin to the upper left hand back of order an addressed ungummed frank. Envelopes, franks and orders must bear the name of our Division and the orders and envelopes the initials of the person ordering the publications. This identification is necessary to permit return if anything is wrong with order, or the publications requested are not available. So far as possible, check to see if publications are still available for distribution before ordering them. It is useless, for example, to put in an order for Bureau of Plant Industry Bulletins and Circulars, Department Circulars (old list), or Department Bulletins. These are no longer available except where copies may be in the hands of the author or the issuing bureau or office.

The maximum number of copies of a publication that may be sent to a Washington, D.C. address is 50; more may be sent to field addresses. When more than 25 are ordered, however, a statement must be furnished explaining need for them. Where publications are sent at the request of a Congressman, use the 5x8 Congressional order form, so that the Office of Information may be able to charge publications to the quotas of the Congressmen ordering them sent out. With foreign addresses, orders are prepared on Form 81 (original) and 81-a (duplicate) both copies being sent to our Business Office so that arrangements may be made for paying postage. The 4x6 foreign frank form must be used. If the publications can be supplied by the Office of Information, they should not accompany the order; otherwise they must be sent with it, the order bearing the word "herewith" below the list of publications to be sent.

Where the same publication is being sent to a number of addresses, use one order form, noting on it "To the_____miscellaneous addresses covered by attached addressed franks."

Vol. 8 No. 4 February 15, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., March 1, 1936 No. 5

Handling and Transportation

"Refrigeration of Oranges in Transit from California," by C. W. Mann and William C. Cooper of our section of fruit and vegetable handling, transportation and storage investigations, has been issued as Technical Bulletin No. 505 in the Department's series. It is an amazing presentation of investigations in this particular field, as is indicated by its 87 pages of text, 32 illustrations and 26 tables of statistical data.

Twenty-nine refrigeration tests were made during the period covered by the experiments reported on, during which temperature and icing records were obtained on 189 carloads of California oranges in transit to Chicago and New York. The fruit in these cars was inspected for decay, pitting, and spotting at the time of unloading and in some cases was inspected again after being held in a wholesale market 1 to 3 weeks.

"The granting of lower rates on the various modified types of refrigeration service tested in this investigation has led to a general adoption of these modified methods in place of the more costly standard refrigeration," the writers announce. "The results indicate that the use of the modified protective services represents an annual saving to the Citrus industry in excess of $1,000,000 when compared with the former cost of refrigeration." Which is just a way of stating that this piece of work is paying the entire cost of our Division!

A reference to specifications for the improved refrigerator car, prepared in conjunction with the engineers of various car lines and railroads and issued by the United States Railroad Administration back in 1918, recalls perhaps the first spectacular appearance in the spotlight of publicity of our fruit and vegetable handling, transportation and

storage project. This improved car, based upon our experimental findings for the most part, won instant approval, filled a vital need, and has saved shippers and railroads millions of dollars. It probably would be no over-statement to say that this one achievement has offset the total cost of all the horticultural investigations of the Department.

It seems to me, however, that the dividend to our stockholders, the American public, has gone far beyond anything that can be put in dollars and cents. The success of highly specialized agricultural enterprises in remote districts, where however, climate and other factors especially favor production, is largely attributable to the use of the successful and economical means of transportation which we have been instrumental in developing and the railroads in applying--to put it modestly. Without these means of transportation, it requires little imagination to picture the Imperial Valley, for example, remaining a desert or at best an alfalfa and stock country--and the Rio Grande Valley anything but the Winter Garden of America. These examples could be multiplied. In other words, I like to think of our work as enabling large and highly specialized agricultural industries to flourish and towns and communities to exist where otherwise would be only the lonesome prairie or the purple sage! (I hope Wm. R. Barger sees this!)

This thought, of course, is not exclusive. A writer in the New York Times Magazine recently touched upon the matter under the title "Summer Foods on the Winter Table." She pointed out that the markets of New York city, for example, present even in the dead of winter a most tempting aspect, piled high with fruits and vegetables which in the course of nature would appear only in the warmer months. It is an amazing picture of progress that this work affords. It is but a relatively short time since strawberries in midwinter were indeed a luxury and somewhat disappointing at that, since the fruit was frequently of inferior quality. And oranges, now considered practically as necessary as milk to health, were distinctly a seasonal product even as late as the beginning of the present century.

"The men who are perfecting these processes are benefactors," declares the New York Times Magazine contributor. "They have, seemingly, annihilated time and space, so that lettuce, for example, in our salad bowl in New York City tonight, might readily have been picked this morning in California, so fresh it is."

No, indeed, the wide variety of fruits and vegetables to be had all year round is not accidental, this writer agrees. "A great many of them used to be imported. Speedier transportation and better refrigeration created a demand which stimulated the grower to plant more of his land in delicate, perishable crops. Heretofore this was a risky undertaking, since what his home market did not absorb was a complete loss to him."

And above all, this is an achievement concerning which practically all of us have inside information--if you follow me?

FRUIT AND VEGETABLE HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash.

"In cooperation with the Western Fruit Express we made a standing test with a carload of Winesap apples," he writes, "using ice in one bunker and automatic alcohol heaters in the opposite bunker--the ice to furnish refrigeration when inside temperatures were above 32°F. and the heaters to blow warm air below the lading when freezing temperatures thermostatically 'turned on the heat.'

"Conditions were not severe enough to warrant a positive opinion on the feasibility of using this type of service but stability of temperatures in the car under Wenatchee winter conditions was such as to warrant a road test during moderate winter conditions over a route terminating in some of the southern markets such as Oklahoma or Texas.

"Assistance was given to the Western Fruit Express Company in their winter transportation test trip leaving Wenatchee January 26th. This test included two cars with charcoal heaters, one with a new type of floor rack and two cars with automatic alcohol heaters, one car having paper over the floor rack, out to the bracing, and one without paper.

"Mr. Ezell left Yakima on January 29th as government observer on a transportation test trip conducted by the Pacific Fruit Express Company from Yakima to Kansas City. This company has been experimenting with about 200 automatic alcohol heaters in commercial shipments during the winter, using Ryan thermographs for temperature records and district officials for observations. Several alterations have been made in their heater following these quasi-commercial tests, the principle difficulty being found in the pilot light. With a percentage of pilot-light failure approximately 1 percent, test operatives feel very optimistic as a result of this work.

"Eastern Washington continued to enjoy a quiet, mild cloudy winter until January 25th, when a fringe of the continent's high barometric pressure area brought clear skies and lower temperatures, reaching a minimum of 1/2°F. during the early morning of January 30, this being the coldest since the morning of November 1st, when 5°F. was recorded.

"We were in Seattle, January 7 and 8 in transportation conferences attendant upon the meeting of producers of frozen-pack vegetables at the Northwest Canners Convention; at Walla Walla, January 13 and 14 at a conference of the Western Cooperative Oil Spray Project; and in Yakima January 20 and 21 in connection with cold storage experiments and while there discussed before the grower meetings of the Yakima Horticultural Club the paper given in December before the Washington State Horticultural Association, entitled, "Fruit injury from freezing Temperatures."

DISEASES OF TRUCK CROPS

H. L. Blood, Logan, Utah

"Heavy storms during the first week of February materially improved the agricultural outlook for this intermountain country," he writes. "Agriculture throughout the Great Basin and the Intermountain country in general is absolutely dependent upon an adequate water supply for irrigation. Due to the extremely dry summer and fall of 1935, added to the general drought of the past few years which has resulted in a depletion of ground water, reduction of the flow in springs, and a lowering of the water level in all lakes, fears were being entertained for the season of 1936. During the past season the Great Salt Lake reached its lowest level in the history of the white man in this section. The moisture situation as a result of a drought cycle was critical and heavy precipitations are joyously welcomed.

"Snow fall in the mountains on February 1st was approximately 25 percent above normal for this time of the year. The first week in February we had our heaviest storm in 20 years. A total of 21 inches in snow with a high water content fell at Logan in about 30 hours of continuous storm. Such precipitation will very materially increase the surplus moisture in the mountains. It is felt generally that this storm assures adequate moisture for the 1936 season. The significance of an adequate water supply and attendant effects upon the morale and attitude of the farmer can be appreciated fully only by those who are intimately acquainted with western agriculture.

"The mild winters and low precipitation prevailing over the past few years have made conditions very favorable generally for the multiplication of the White Fly (Eutettix tenallus Baker) the insect vector of the curly-top virus. The result has been four curly-top epiphytotics in tomatoes in six years. It is now felt that the passing winter with its widely fluctuating temperatures and frequent rains followed by this recent good old fashioned winter storm and subsequent reduced temperature has been one that is not conducive to successful over wintering by the insect responsible for the dissemination of the curly-top virus. The adverse conditions will tend to reduce materially the number of insects surviving the winter and the resultant spring population. A very marked spirit of optimism has developed among the farmers and the canners expect little difficulty in securing contract acreages for the 1936 campaign. 'Hope springs eternal in the human breast!'

"This storm will delay the planting season fully two weeks throughout the Great Basin district. Such a delay will bring the planting season nearer the normal, and with the abundant water supply assured, a good season may be hoped for. Spring will soon be opening up in the southern Utah section and sugar beet plantings will be made by way of preparing our trial grounds for the 1936 tomato curly-top resistance tests."

FRUIT AND VEGETABLE UTILIZATION

Peaches Circular No. 372, "Varietal Suitability of Peaches for Preserve Making and Factors Affecting the Quality of the Product," by H. H. Moon, C. W. Culpepper, and Joseph S. Caldwell has recently been issued.

The authors began their studies of the utilization of peaches in 1924, at the solicitation of Georgia growers who had become seriously concerned over the problem of overproduction. The work has been in progress continuously since, and the present circular is the eleventh paper reporting results obtained with one phase or another of the general problem.

The work was carried on for several years at a field station established at Fort Valley, Ga., in the heart of the principal peach-growing section of the State, and was continued there until work on such phases of the problem as could be handled with the facilities possible to obtain in the field had been completed. Four bulletins or journal artides reporting results of work done chiefly or wholly at Fort Valley were published.

In the meantime, the authors had become impressed with the necessity and desirability of establishing a varietal collection which should include as nearly as possible all varieties at all extensively grown anywhere in the country, and of making detailed comparative studies of the possibilities of these varieties for various utilization purposes under conditions which could be controlled and with all the facilities of the Washington laboratories.

Such a collection was established at Arlington Experiment Farm and as it came into bearing systematic studies of each variety with respect to its suitability for various methods of preservation have been in progress. Such detailed testing of the material, when accompanied by physical and chemical studies of the fruit and of the changes occurring in the course of the ripening process, should give information of immediate practical interest to canners and preservers and at the same time contribute to an understanding of the factors or combination of factors that determine the suitability of the fruit for any particular purpose.

The necessity for such studies has been emphasized by the disastrous results of commercial attempts to apply a routine method of preservation to a miscellaneous group of varieties, which have shown that closely related varieties may display wide differences in their response to a given preservative treatment. The method of individual and comparative study of varieties has been employed in the studies of freezing preservation of peaches, upon which the writers have reported in a number of articles in technical journals, and is that employed in the present paper.

FRUIT DISEASES

Lee M. Hutchins, Fort Valley, Ga.

"We are reporting this week on the condition of peach buds in the immediate Fort Valley territory," he writes February 10th. "During the winter, the temperature has dropped to 15°F. on two occasions and we have had numerous freezes.

"Examination of approximately 200 flower buds per variety shows the following percentages of dead buds: Mayflower, 17 percent killed; Early Rose, 10 percent killed; Uneeda, 2-1/2 percent killed; Hiley, 10 percent killed; and Elberta, 20 percent killed.

"It should be mentioned that there is considerable variation by orchards, ages of trees, and general vigor of trees, but the above percentages may be taken as a fair indication of the condition of peach buds here at the present time. The set of flower buds is sufficiently heavy so that these losses are insignificant in so far as present crop injury is concerned. An average peach tree eight years old at Fort Valley may be expected to bear approximately 20,000 bloom buds. The trees in this district are pruned so that the crop is harvested from the ground. One thousand good peaches per tree is a fair average.

"Twigs were collected in this vicinity on February 2, 1936, and were brought into the greenhouse. In a recent report we mentioned that the accumulation of hours of cold at 45°F. and below up to February 1 was 1,099, which is well in excess of the required number of hours to bring all varieties into bloom promptly with the arrival of warm spring temperatures. The flower buds of these twigs are now rapidly expanding, which illustrates the point made in our recent report."

H. F. Bergman, Amherst, Mass.

Writing from the Cranberry Disease Field Laboratory on February 8th, he reports that most of the week was spent in tabulating analytical data on copper investigations from last year's analyses of soils and vines, and making calculations that had not been previously made.

"February 7th and 8th, I calculated percentages of spoilage due to specific fungi in berries from some of our spraying experiments of last summer. From data so far available it appears that certain fungi are very prevalent on some bogs year after year, and occur to a very limited extent on other bogs.

"The weather has been steadily cold, temperatures down to zero or slightly below, but no snow. We had a little rain and sleet last Tuesday."

HORTICULTURAL FIELD STATION, BELTSVILLE, MD.

Small Fruits at Beltsville, Md.

"Previous work on the effect of photoperiodism on growth and reproduction in the strawberry has been followed up this winter by a study of the interrelation of temperature and photoperiodism as it affects vegetative and reproductive growth of 13 different varieties," writes Dr. George M. Darrow.

"Nine different conditions were used--16-hour, 14-hour, and normal daily light periods at 55°, 60° and 70° F. in three sections of a greenhouse. The light series started September 1. The differential temperatures have been maintained remarkably closely since November 1 by ordinary ventilator control. Under the long (16-hour) days at 60° and 70°, and under 14-hour days at 70°, runner (364 runners and 10 flower clusters) have been produced just as under field conditions in northern United States. Under 14-hour days at 70° also, just as under field conditions in North Carolina, Arkansas, and the interior valleys of California, runners (127 runners and 13 flower clusters) have been produced. Under long days (16-hours) at low temperatures (55°), just as along the coast of Washington State, only 1 flower cluster and 73 runners have been formed during the three months. But under the normal short days of 10-1/2 to 11 hours at 70°, 60° and 55°, fruit-buds (6 runners and 269 flower clusters) have been produced just as in Florida. Apparently low temperatures are far less effective than short days in initiating fruit-bud formation. At present, respiration and food manufacture seem almost exactly balanced at 55° and 60° under the 14-hour day.

"For the last two weeks, several series of strawberries have been run to determine whether the chromosome number of 7- and 28-chromosome plants can be doubled or affected by 'shocking' the fertilized egg or the runner tips with high temperatures. The temperatures used ranged from 90 to 120° for 1 to several hours."

Filbert Hybrids at Beltsville, Md.

Mr. C. A. Reed, writing on February 13th, says: "An interesting group of filbert hybrids has been brought into being during the last seven years by our specialists. In order to develop varieties of filbert which would be hardy in the East, crosses were first made in 1928 between the Rush variety of Corylus americana, one of the two native species indigenous in this part of the country, with certain available leading varieties of the European filbert. Crops of nuts ranging from a few nuts each to more than a pound to the tree were harvested from several hundred of the resulting plants in 1935. Critical study of these nuts has resulted in the selection of a score or more which are considered as being surprisingly good for the F_1 generation.

HORTICULTURAL FIELD STATION, BELTSVILLE, MD.

Filbert Hybrids (continued)

"The pollen parents used have been of such varieties as Barcelona, DuChilly, the Red and White Avelines, the Red and White Lamberts, Bolwyller, Cosford, Brixnut, Italian Red, Imperial, Kentish Cob and some others. In a few cases crosses were made with seedlings of such other species as C. maxima, one of the largest-growing species of shrub hazels of Europe and supposed to be in part one of the parent species of the cultivated filbert; C. heterophylla, a Chinese species not supposed to be directly related to the filberts; and C. colurna, a tree species from Turkey. In each case where the pistillate variety used was Rush or some other of the same species a certain number of crosses appeared actually to have been effected. On the other hand, no results were obtained from reciprocal crosses."

NUT PRODUCTION

Milo N. Wood, Sacramento, Calif.

Writing on February 1, he reported that almonds were blooming much earlier than usual. "Some emasculations for the pollination work were made during the week ending February 1, and some almond pollen collected.

"The recent rains have had a very beneficial effect upon the orchards in the dryland areas. In most of the almond orchards the fruit buds are numerous and thrifty and in the districts seen thus far the promise of heavy crops is good from the fruit-bud standpoint. If the almonds escape frost, brown rot, etc., this may be a year of bumper almond crops in some of the districts."

George P. Hoffmann, Meridian, Miss.

During the week ending February 8th, he reports, there was continued unfavorable weather--low temperatures and the most destructive rainfall during years, greatly retarding the progress of outside work.

"During Monday and Monday night, rain was almost continuous with the official record indicating 7.69 inches for the 24-hour period. Serious damage was done to roads, bridges, and personal property in the vicinity of Meridian. With the exception of considerable erosion in the south and southwest areas of the farm, our Station suffered no damage. During the 'downpour' our storm water disposal system has paid for itself many times over."

He had written February 1: "The weather for the week ending February 1 is recorded as the longest continuous cold spell of this winter--highest temperature 39° F. and lowest 17°, with only one clear day for the week. This winter is considered as being abnormally hard for this section."

NUT PRODUCTION AND DISEASES

Max B. Hardy, Albany, Ga.

"The rainfall for the month of January at Philema totalled 8.06 inches, and at Dewitt 6.46 inches. This is a good start for the year and should prove of great value in raising the water table to a more satisfactory level. Many ponds which have been dry for several years now contain water and many contain more water than has been seen in them for about the same number of years.

"Unless a late freeze should catch the peach bloom, the peach growers in this section are expecting to profit by the continued cold which has been experienced this winter. We have now enough hours of cold to bring out the peach blossoms at the first real warm spell and still the weather man predicts more cold. Fortunately, the low temperatures have been more constant than extremely low and no injury directly from the cold is apparent at this time."

Paul W. Miller, Corvallis, Oreg.

"The Barcelona variety of filbert is now in full bloom," he writes under date of February 1. "The Nottingham and Daviana varieties, which are pollenizers, are practically through shedding pollen.

"According to some weather statistics recently released by the Government meteorologist at Portland, Oreg., January was warmer and wetter than usual and had more than the average amount of sunshine for the month. Normally an excessive amount of rainfall means less sunshine but not so during the month just ended. Precipitation amounted to 8.55 inches at Portland, or nearly 2 inches over the normal of 6.6 inches.

Writing February 8th, he reports: "The Barcelona variety of filberts is practically through blooming. There is every indication that there is going to be a light filbert crop this season in Oregon, at least in certain sections, as there is a scarcity of pistillate flowers in the trees. Preliminary studies indicate that this may be due, in part at least, to injury to female flower buds by the freeze which occurred during the latter part of October, 1935."

C. E. Schuster, Corvallis, Oreg.

Writing concerning activities for the January 27th-February 8th period he says: "We have been attending at intervals County Economic Conferences for a day and have been getting very extensive, widespread reports of winter injury on walnuts. The majority of the growers are just becoming aware of the fact that the greatest damage occurred on the north side of the trees just above the snow line...As time goes on, reports are coming in more positive and apparently not only from the lowlands but from the upper elevations as well...."

ADMINISTRATIVE NOTES

Outside Publication. Papers, radio talks, etc. treating in any way of the work or policies of the Department must be approved before being offered for outside publication. There is no objection to a preliminary discussion with publishers, as we prefer to know in asking for the approval the name of the publication or printed proceedings to use the paper, and whether there will be any compensation for it.

All such manuscripts should be headed, for proper identification and credit: "UNITED STATES DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry. Title_____By John Doe, assistant horticulturist, Division of Fruit and Vegetable Crops and Diseases." Two copies are needed one of which should be the original (which will be returned to you with the approval, any necessary changes being indicated) to spare the reviewing officers the necessity of reading the sometimes pale and incomplete carbon.

It is very important to get the papers to us in time to permit adequate consideration. They go first to Dr. Auchter for his preliminary approval, to Mr. Gilbert for editorial and subject matter review, and then to the Chief of Bureau for approval. When such papers are received at practically the last minute before the date of the meeting before which they are to be read, it is impossible to give them proper attention, and in order to secure approval in time it is necessary to stop other important work and devote immediate attention to them, a proceeding manifestly unfair to others who have papers being considered. Try to get the ORIGINAL and one carbon copy of your paper to us a WEEK before the date of the meeting--earlier if a four- or five-day mail trip will be needed to get the manuscript and approval back to you on time. Telegraphed approvals are often undesirable as it may be impracticable to indicate clearly the changes considered desirable in the paper.

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Electricity, Gas and Water. No, this has no connection with the preceding discussion! It is merely to call attention to the necessity for submitting new schedules when changes occur in rates charged for electricity, gas and water. Since vouchers cannot be passed for payment until the new rates have been made a part of the original contract, schedules of the new rates should be forwarded, in TRIPLICATE, to the Business Office as soon as the change occurs.

It is also urged that you familiarize yourselves with the instructions on the reverse side of Standard Form No. 40, covering telephone service, especially Section 2(d), wherein it is specified that a supplemental contract is required for any supplementary addition to, discontinuance of, or change in any existing service. When ANY change in service is anticipated, the Business Office should be notified and a supplemental contract secured, in order that the change may be approved BEFORE it becomes effective.

ADMINISTRATIVE NOTES

Radiotelegrams and Telegrams. In my casual way, I have now and then referred to the fact that our Division consistently returns a dividend on the investment in it. Well, we can also show a prophet! I mean Roy Gillette. Only a little while ago (News Letter of February 1) he warned that failure to utilize the radiotelegram would likely be made a capital offense--that is to say, affecting your capital through suspensions. We have just received a copy of Budget and Finance Circular No. 20, dated February 6, reading:

"The attention of officers and employees of the Federal Government should be directed to the fact that radiotelegrams may be transmitted between many of the large cities of the United States more cheaply than telegrams. In order that there may be full compliance with the well-established principle of utilizing the most economical services available, which is for general application and observance by all who are authorized to incur expenses chargeable to public funds, care should be exercised to see that messages are transmitted by the most economical method."

These are the words of the Comptroller General. To them the Department's Director of Finance adds: "To avoid possible suspensions by the General Accounting Office, the requirements set forth by the Comptroller General must be carefully observed by all employees of the Department of Agriculture in sending official messages from those cities in which commercial radio facilities are available.

"For the information and guidance of all concerned, the Superintendent of Telegraph and Telephone of the Department has prepared the following bulletin on the existing commercial radio facilities and their use:

> "'The Radio Corporation of America Communications, Inc. and the Mackay Radio and Telegraph Company have inaugurated a number of domestic radio stations for the handling of messages within the continental limits of the United States.
>
> "'Their rates are based upon a minimum count of 15 words in day messages and night messages instead of the 10 word messages of the commercial telegraph companies, and a minimum of 60 words in night letters and day letters instead of the 50 word messages of the commercial telegraph companies.
>
> "'In view of the necessity of using that service for official messages which affords the cheapest rates, the following list of cities is given in which the radio systems have established stations for handling commercial business:

MACKAY RADIO AND TELEGRAPH COMPANY

New York	Camden	San Francisco
Philadelphia	Detroit	Oakland
Chicago	Seattle	Los Angeles
New Orleans	Tacoma	San Diego
Boston	Portland	Washington, D.C.

"'RADIO CORPORATION OF AMERICA COMMUNICATIONS, INC.

Baltimore	Detroit	Philadelphia
Boston	Los Angeles	San Francisco
Camden	New Orleans	Seattle
Chicago	New York	Washington, D.C.

"'Messages from or to all suburbs of these cities taking the same rate as the respective city are handled without additional charge. It is important to note that messages can only be sent from and to the cities listed on each of the two systems, i.e., a message cannot be sent from a listed city to an unlisted point or from an unlisted point to a city which appears on the list. Messages are not transferrable from one system to another and can only be handled between the points served by the originating system.

"' The pickup and delivery is effected by the Western Union Telegraph Company for the Radio Corporation of America Communications, Inc., in addition to any pickup and delivery service of the R.C.A., and by the Postal Telegraph-Cable Company for the Mackay Radio and Telegraph Company. It will be necessary to designate by notation on the blank used the name of the company whose service is desired, as 'Via R.C.A.' or Via Mackay Radio', when messages are picked up by or filed with Western Union or Postal Telegraph offices in the cities listed for transmission via radio.

"'Telegrams handled through the Department Telegraph Office in Washington will, of course, be routed via the company affording the cheapest rate. Telegrams filed directly with the companies in Washington or by field stations in the cities listed or by individuals in travel status in these cities must be routed via commercial radio companies where economy can be effected. In view of the minimum rates charges, it is obvious that no economy would be effected on day messages and night messages of 10 words or less and day letters and night letters of 50 words or less and these may therefore be filed for transmission either by the companies doing a commerical telegraph business or by the commercial radio companies.

"'The service offered by the commercial radio companies which is the subject of this circular should not be confused with the radio service rendered by the Army Message Center and the Naval Communication Service, as it has no connection with these Government facilities."

"'If either of the radio companies should add other cities to its network, information in regard thereto will be furnished employees of the Department in a supplement to this circular.'"

ADMINISTRATIVE NOTES

CONTRACTS, LEASES, ETC. As things picked up a little during the past year or so, an old farmer finally managed to complete payment on a small farm. The agent came and brought him a deed. "If it is all the same to you," said the old farmer, "I'd rather have a mortgage than that deed," The agent was very much amused. "I see you do not understand just what a deed is--how different it is from a mortgage." The farmer looked at the paper doubtfully. "Maybe not", he agreed. "But I owned a farm before, you know, and I had a deed, and the First National Bank had a mortgage--and what I know is that the bank got the farm!"

This is just as sort of gentle reminder that one has to be very careful about legal papers. Just now it is time to check up on your leases, short term rental agreements, and utility contracts for the fiscal year beginning July 1, 1936--that is, the Fiscal Year 1937. Year after year the Business Office has issued a warning about checking up these papers sufficiently in advance to have necessary action taken before July 1--and year after year a number of our field representatives wait until the very last minute to indicate their needs for the new fiscal year. Quite often, in fact, they wait several months before advising us that certain contracts should have been prepared as of July 1! Not only must such delays be backed by watertight explanations of the reason for the failure to get in requests in proper time, but even with the best of explanations we are never sure that the contract, etc. will then be approved.

It is essential that all requests for new contracts and renewals be submitted BEFORE the beginning of the new fiscal year--meaning before <u>July 1, 1936</u>--not July 1, 1937! The Business Office has no way of knowing the requirements of the men in the field, in spite of Roy Gillette's gift of prophesy in certain directions, andit asks your cooperation to the extent of seeing that it is notified AT ONCE just what agreements you wish to secure or to renew for the fiscal year beginning July 1, 1936. Mr. Gillette will then furnish you with the necessary instructions and forms.

You remember, of course, that short term rental agreements must be secured for <u>all services other than personal</u>--such as laundry, ice, mule hire, spraying machines, etc., that extend regularly over a period of more than four months. Short term rental agreements may also be used where the rental does not exceed $100.00 per annum for land, garage space, etc., but in <u>any</u> event where the annual rental exceeds $50.00 competition must be obtained.

In case of doubt, write the Business Office immediately.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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Emergency Purchases

Section 3709, Revised Statutes, requires that all purchases and contracts for supplies or services shall be made by advertising a sufficient time previously for proposals respecting the same, except when the public exigencies require the immediate delivery of the articles or performance of the services, and in the absence of such an emergency as contemplated by the statute, purchase by any other means than advertising for proposals a sufficient time previously, is unauthorized.

What constitutes such an emergency? It is a sudden or unexpected happening; an unforeseen occurrence or condition; specifically, a perplexing contingency or complication of circumstances; a sudden or unexpected occasion for action; an exigency. The mere statement of the purchasing officer is not sufficient to establish the existence of an emergency within contemplation of the statutes, nor may an emergency be administratively created and used as a basis for making award of a contract or purchase of materials or supplies without advertising for competition as required by law.

The Comptroller General has gone into this in some detail in a decision (A-61431) in connection with a purchase of gloves. In December 1933 a concern was requested by the Civil Works Administration of Chicago to submit a bid for gloves to be used by men employed on Civil Works Administration projects in Chicago and vicinity. It is reported that bids were solicited by telephone. A bid of 98 cents a dozen pairs was accepted and 50,000 pairs delivered at this price. In the meantime, however, the bidder had "cornered the market" by entering into an agreement to take the entire output of the glove manufacturer, and

increased the price to $1.15. No other dealers were in a position to bid on such gloves, and the manufacturer refused to submit a bid, so the Civil Works Administration purchased 42,785 pairs at the new price. When the bill was rendered the Federal Civil Works Administration of Illinois approved payment at 98 cents a dozen only. The claimants accepted this under protest.

It appears that the delivery of the 42,785 pairs of gloves ordered December 19, 1933, was not completed until January 6, 1934, 18 days later, and that the so-called emergency purchase orders were issued from time to time as additional gloves were needed. While emergency statements were furnished to the effect that the gloves were necessary to keep the men at work, the Comptroller General takes the position that the situation could have been foreseen. Cold weather is to be expected in Chicago in December.

In other words, known, normal, and recognized conditions properly to be anticipated, such as cold weather in the northern part of the United States during the winter, do not constitute an emergency and may not be converted into an emergency condition merely by a decision to act thereon. So-called emergency purchases--that is, purchases made without employing the safeguard of competitive bids--are justified only where a happening that could not reasonably have been anticipated requires, in the public interest, the acquiring of those things essential to meet such emergency. Then only may this statutory safeguard be disregarded, and even then only in the acquiring of those things essential to meet the emergency.

Too, the decision points out that a contractor is charged with knowledge not only of statutory requirements, but with limitations upon the authority of an agent of the Government with whom he deals. When such agent exceeds his authority by undertaking to contract in violation of statutory requirements, the Government is not bound by the unauthorized act. The contracting officer, that is, acts as the agent of the United States of America, and as such is without authority to enter into contracts except in accordance with law.

In the case in question, the Comptroller General ruled that the claimants had no rights against the Government as contractors and thus were relegated to any rights they might have to payment on a quantum valebat basis. Since the records showed that they had been furnishing these gloves at 98 cents, and that the price of the manufacturer to them had not been increased, the 98-cent rate was accepted as reasonable and the claim for $1.15 disallowed.

All of which, of course, emphasizes the importance of foreseeing needs in ample time to permit securing of competitive bids. While emergency purchases are necessary at times, there must be a real emergency, supported by a watertight statement with the voucher, to make certain payment will be made.

NUT PRODUCTION

C. E. Schuster, Corvallis, Oreg.

"Considerable interest was noted at the economic conference in regard to the future possibilities of both walnuts and filberts" he reports February 22d; "particularly was this the case in view of the heavy winter damage in the Willamette valley.

"In the Umpqua valley we found the same type of winter injury though probably in a lesser degree. Young trees in some cases are apparently totally killed to the ground line, and with older trees there is a heavy loss of buds. The local nurseryman in that section is not using any of the propagating wood in that section at all, but is ordering it from California. A good bit of material was examined and scarcely any of it but had more or less evidence of damage.

"The nursery stock of walnuts was all killed. Again this killing was just limited to the two-year-old wood or the wood that was set in as a scion. The only other nursery stock that suffered in this way was Japanese persimmon. These apparently were completely killed to the ground line. Holly at this place was somewhat damaged, but apparently will recover. Damage to other nursery stock was practically nothing."

Writing on February 15th concerning winter damage, he said: "As a consequence of this winter damage, we will have no data from the production standpoint on the filbert, and we do not intend to do any pruning at all. There is just enough damaged tissue so that we do not want to leave any exposed wounds at the present time. This freeze has eliminated all pruning work and apparently all pollination work on both walnuts and filberts. There may be a chance to do some pollination work on walnuts.

"The nursery stock of walnuts is apparently destroyed 100 percent. A month ago we had conflicting reports. Some nurserymen reported their trees completely killed while others reported no damage at all. As it turned out, all of the stock has been damaged so badly apparently that none of it can, or should, be sold. The nurseryman usually looks for damage in the growth made the previous year and in the buds. Examination of that material of two-year-old wood led me to believe that no damage was evident. However, the two-year-old wood or that piece of scion set into the rootstock last spring has been killed in practically every case. That wood just next to the union has been destroyed....

"Other nursery trees that usually take about the same degree of damage as walnuts show none at all, according to reports. In the ornamental line, the nurserymen report that there is no damage to speak of except in one Japanese azalea, which has been killed 100 percent in the same way that the walnut has."

NUT PRODUCTION

Max B. Hardy, Albany, Ga.

Writing February 29th of his attendance at the meetings of the Southeastern Pecan Growers Association, he says: "The trend of the general discussion showed a growing interest, at least of the better growers, in such orchard operations as thinning the stand of trees, spraying, topworking, cultivation and fertilization. The question of what varieties to use in topworking came up and the concensus of opinion appeared to favor such varieties as were prolific, relatively resistant to disease and insect injury, and early maturing. The Moore variety was accepted as possessing most of these qualities, and was reported as being widely used in topworking, a trend not meeting with great favor with the distributors...

"Most of the days of the past week were clear and warm with the result that by the end of the week peaches, pears, Japanese magnolias, and red-bud were all bursting into bloom. Many other plants are showing signs of growth. Unless cold weather again sets in, all indications point to an early spring."

He had written February 15th of a trip made to a pecan planting in Lee County for the purpose of selecting trees upon which to take records for the determination of the effects of an orchard management plan which the owner is going to initiate.

"The owner, Mr. R. H. Waugh," he wrote, "is going into the hog-raising business to some extent and is interested in combining this business and pecan growing in a satisfactory manner if possible. He plans to use runner peanuts in the orchard, planting and cultivating them in the usual manner in the tree middles, but allowing the hogs to harvest the peanuts. He expects the trees to be but little if any injured by this plan and possibly helped through the growing of this legume and expects to get a good profit on his hogs...."

POTATO INVESTIGATIONS

W. C. Edmundson, Greeley, Colo.

"During the past few days we have had some real winter weather, similar to the winter which they have been having in other parts of the United States," he writes in a letter to Dr. Auchter, February 12th. "One night the mercury dropped to 37° below zero. There has been very little snow on the prairie, but a good supply of snow is reported in the mountain area.

"We are experiencing much difficulty in digging the ditch for our pipe line because the ground is frozen as deep as the ditch we are digging."

NUT PRODUCTION AND DISEASES

C. L. Smith, Austin, Texas.

"During the week," he writes February 15th, "a trip was made to the Brownwood station to secure expermental data on trees in transplanting and root-pruning experiments. Trees in these experiments were dug up, the necessary data recorded, and the trees then photographed. From the data secured, it appears that undercutting taproots of pecan trees in the nursery one year before transplanting is very beneficial to heavy taprooted trees in the ability with which they transplant and grow the first year."

Paul W. Miller, Corvallis, Oreg.

"Preliminary results of filbert blight infection studies conducted during the last three or four weeks were taken during the week," he writes February 22d. Results of these studies indicate (1) that the embryonic leaves in filbert buds are susceptible to blight infection just as soon as the scales part sufficiently to expose the green tips and (2) that an incubation period of 70° F. is more favorable for disease development than 55°."

He had written February 15th: "Reports of damage to walnut orchards from the freeze which occurred during the latter part of October 1935 continue to be received from various sections of western Oregon as far south as Roseburg. In many orchards the injured tissues are becoming progressively browner and dryer instead of clearing up. The younger orchards, particularly the better cared for plantings, located on the valley floors or river bottoms are the most severely injured, although older trees up to 16 years of age have been injured to some extent. While the damage is worse in orchards located on the valley floor, some damage has also been recorded from the foothills. Up to the present, no damage to the northern California black walnut has been seen or reported."

ADMINISTRATIVE NOTE

Anthracite Coal is-- A special notice issued under date of February 20th, advises us that a resolution has been adopted by the National Bituminous Coal Commission which interprets the meaning of the term "Anthracite coal." This Resolution (No. 22) states that anthracite coal within the meaning of the language of the Bituminous Coal Conservation Act of 1935 means only anthracite coal mined in the State of Pennsylvania. All other coal is considered bituminous by the Commission.

NUT PRODUCTION

Milo N. Wood, Sacramento, Calif.

"The almonds are blooming very much earlier this year than last," he reports for the week ending February 29th. "In fact, all the almond pollination work in the field will be over by the middle of next week.

"Since almonds started to bloom, there has been very little sunshine, with the exception of a few hours on one or two days. Early blooming varieties, such as the Ne Plus Ultra and I. X. L. will probably be light in most sections of the Sacramento and northern part of the San Joaquin valleys because the rain and wind have prevented the bees from working in the orchards. During the last two days we have had sunny weather and it is possible that late blooming varieties, such as the Sultana, Texas, Languedoc, and probably the Drake, may come through with good crops."

On February 15 he wrote: "We have been very busy with almond pollination and almond breeding work. We now have thousands of blossoms emasculated and some pollen has been applied. To date the weather has been exceedingly unfavorable for pollination work. Since the blooming season began, we have had sunshine only for two days and we have emasculated blossoms in the rain and applied considerable pollen only to find that the rains followed immediately after. We therefore expect more loss this year than usual from the weather.

"The weather has been such, too, that the bees have been prevented from working in the orchards. For that reason there may be much trouble from lack of pollination and perhaps the crop may be very light, although in other respects conditions are favorable for a heavy crop.

FRUIT PRODUCTION

C. F. Kinman, Sacramento, Calif.

Writing on February 25th, he reports: "February 24th completed the 15th consecutive day we have had of rain.

"The orchard soils in the Sacramento valley and northern California generally are in better condition than they have been for a number of years so far as the moisture is concerned and the rivers are up almost to the flood stage. The serious drawback to such weather is that orchard tree blossoms that have opened during the rainy period have been poorly pollinated. A number of fruits are starting to blossom."

FRUIT PRODUCTION

C. F. Kinman, Sacramento, Calif. (continued)

"In contrast to the temperatures that have been so harmful to the fruit trees in the middle-northern States, cool, cloudy weather with rain has prevailed in most of the fruit growing districts in California for a number of days and this is just what was needed here. The southern part of the State was badly in need of rain and prolonged periods of warm sunny days favored delayed foliation in deciduous fruit trees. The change in weather conditions gives hope that less loss from delayed foliation will result than was feared. The entire winter has been highly favorable to deciduous fruits in the Sacramento Valley so far. It appears that the trees will blossom a little ahead of normal and this, of course, increases frost hazards." This was written February 25th.

"Last Monday evening I left for a short visit to orchard districts in Southern California and arrived there just in time to meet the heavy storm. It rained almost continuously so I left the second evening. I was able to visit a few peach orchards in the Pomona and Ontario districts. I was anxious to see some Muir trees down there and found a few, all of which appeared to be entirely healthy."

He had written February 10th: "After about 10 days of cool nights with sharp frosts almost every morning orchard soil temperatures have stood from about 46° at one foot up to 50° at a depth of four feet. During this period some root extension has been recorded for pear, cherry, peach, apricot and olive."

---------- ADMINISTRATIVE SPECIAL ----------

Letters of Authorization

When it is necessary to telephone or telegraph for an amendment or a new letter of authorization, the first thing to do is to fill out completely the proper form and have it with you when making the telephone call or preparing the telegram. It is absolutely necessary that full information be available here in order to prepare the authorization or amendment satisfactorily; otherwise it often happens that additional amendments must be rushed through later and unnecessary work piled up all along the line.

Do you realize that Uncle Sam's funds are so carefully protected that it requires at least seven persons to approve one of our letters of authorization or an amendment? In a busy day several incomplete requests can seriously interrupt the proper functioning of the machinery utilized for helping your work. Please take the time to give the information necessary for securing promptly the authorization you desire. In case the request is telephoned or sent by telegram, by all means follow it up with the regular form, completely made out and signed, as a confirmation.

FRUIT PRODUCTION

W. W. Aldrich, Medford, Oreg.

"The early part of the week brought continued warm weather," he writes February 24th, "with air temperatures between 35° and 60°, and rain and wet snow at the end of the week. This weather resulted in continued fruit-bud opening and an extremely muddy soil condition. This muddy condition is so serious for the heavier soils that commercial pruning operations have been more or less suspended, and the application of the delayed-dormant, lime sulphur spray has also been delayed. For the very large orchards this delay will mean serious difficulties in completing the dormant spray before fruit-buds are out to the extent that they will be susceptible to spray injury....

"A few more nitrogen determinations were made in the laboratory. Analyses of root samples in the Clancy fertilizer plots shows that the nitrogen content of small roots had increased about 30 percent for all plots between December 1 and February 1, with no greater increase in the fall fertilized plots and the others. The nitrogen content of blossom clusters and cluster bases for different pruning treatments for 1934 and 1935 showed no difference in nitrogen content with different amounts of pruning. This was somewhat of a surprise. It is possible that samples taken after full bloom will show differences not apparent before or at the time of full bloom."

"He had written February 17th: "Anjou fruit buds enlarged appreciably during the week, and showed the fuzzy, brown bud tip typical of the initiation of fruit bud opening. Almond and plum buds are also showing green between the bud scales. The oats or wheat cover crops made considerable growth during the last ten days. In other words, early spring weather in the Rogue River valley has begun at the normal time....

"From now on this spring, I plan to compare soil temperatures, air temperatures, pH, time of most rapid root growth, time of full bloom, and set of fruit for one very heavy with one fairly light soil. I have been impressed by the fact in the past that Anjou set of fruit has been on the average much greater for the light than for the heavy soil types. Examination of young trees grown one year in each of three soil types showed a great many more fine, extensively branched roots for the light than for the heavy soil. This was the first definite observation to show that lighter soil might have better pear root development.

"That fact in itself would supply a plausible explanation for the better set of fruit, to wit, facilitating more rapid nitrogen intake during the period of blossom opening and leaf bloom. I hope a close comparison of Anjou root and tree growth in clay adobe soil at the Medford Experiment Station and in Neal fine, sandy loam at the Pepper-Taylor orchard, will give some definite information. Unfortunately, there are no mature Bosc trees for study in the Pepper-Taylor orchard."

FRUIT AND VEGETABLE HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash.

"As a result of our contact with the North Central Washington Field Men's Association," he reports February 15h, "acute interest in the problem of mealy and stale Delicious has been generated. A special meeting, open to growers and shippers, was called by the Association on February 12th solely to consider this subject, and we were asked to lead the discussion. About 100 were in attendance, and deep interest was apparent.

Following this interest the Okanogan Valley Horticultural and Traffic Association asked that we lead a similar discussion before their annual meeting on February 14th. We believe this interest will be followed with the establishment of standing committees throughout the Northwest for the purpose of 'safe-guarding' the Delicious from tree to consumer and in this the results of our research work will be applied....

"Eastern Washington has had its winter weather late in the season and it still prevails, with -9°F., the season's minimum, occurring on the morning of February 14. However, absolute quiet has prevailed and a blanket of from 12 to 15 inches of snow has given an esthetic mantle of winter without any of the hardships reported from other regions. Probably eastern Washington has the most perfect winter weather of any part of the world."

FRUIT DISEASES

John C. Dunegan, Fayetteville, Ark.

"Further information about peach bud situation indicates that the cold weather injury is confined largely to the orchards of northwest Arkansas," he writes February 29th. "The section about Clarksville has suffered a 20-25 percent reduction in bud crop, while the Nashville section, according to reliable reports, has lost only about 10 percent, and the Crowley's Ridge section has suffered a similar light loss."

He had written February 22d: "I took advantage of the moderating temperatures on the 21st and visited several peach orchards in the vicinity of Springdale, Ark. In one Elberta orchard I examined a total of 207 buds on limbs invarious parts of the orchard, and 206 were dead. One grower told me he had examined more than 50 buds in his Elberta orchard and they were all dead....Here at Fayetteville the peach buds show a high mortality at the University of Arkansas farm, and the cherry buds also show injury."

FRUIT DISEASES

John C. Dunegan, Fayetteville, Ark. (continued)

"The weather continues to be the main news topic of the week," he writes for the week ending February 15th. "We have experienced further sudden drops in temperature, a light snow fall and claudy days with moderate temperatures. The changes come with startling swiftness and there is no indication that conditions are settled at the present time. Preliminary plans were drawn up during the week for the 1936 spray experiment and the work of accumulating the various materials needed is under way....The cultures started last week with the pear measles material from Dr. W. W. Aldrich at Medford, Oreg., have yielded a variety of organisms but presumably they are all secondary invaders of the injured tissues. This initial work involved the use of specimens showing advanced stages of the disease, and it is not surprising to find that secondary organisms are abundant. Further work is in progress with younger stages of the disease."

M. A. Smith, Springfield, Mo.

Writing from the Ozark Fruit Disease Laboratory on February 22, he reports that during the period from February 1 to 21, the minimum temperature ranged from -8°F. on the 19th to a high of 27° on the 12th. A minimum of -4° was recorded on the 17th, -1° on the 4th, 0 on the 9th, and -1 on the 8th and 10th. The records show that February 22d, the day on which the report was written, was the 39th consecutive day that the minimum had been 32° or less.

"We have naturally been much concerned because of the possible effect of these low temperatures on fruit buds and on the trees themselves," he writes.

"Last week counts were made of peach and plum buds at the State Fruit Experiment Station at Mountain Grove. After going through the peach varieties rather carefully, the counts showed 35-40 percent of the Hale and Elberta buds alive. Other peach varieties showed even higher percentages of live buds.

"On Wednesday of this week, February 19th, the lowest temperature of the winter, -8°F., was recorded. Yesterday, February 21, the peaches, plums, cherries and applies at the Mountain Grove station were again examined and counts of live and dead buds made. The results showed 20-25 percent of the Hale and Elberta buds alive. Plum bud counts showed 20-40 percent alive. Cherries and apples have apparently come through the winter with no appreciable bud injury.

"To date we have not observed that there has been any winter injury to peach or apple trees--at least the inner bark and cambium has shown no blackening and there has been no bark splitting."

ADMINISTRATIVE NOTES

Lighthouses

There is a story concerning a Chinese grower who secured a long-time lease on a tiny island on the California coast. By hard work he developed it into a very profitable truck garden. When a Government official came one day to tell him that he must vacate, he was quite upset. The official explained that there was a lot of fog along the coast and the Government wanted to put up a lighthouse on the tiny island for the benefit of ships. The old fellow shook his head. "No good," he declared. "Lighthouse no good for fog." The official asked why he said that.

"Listen," said the old fellow, "fo' I come here I lived long time in Oakland, acloss Bay flom San F'lisco. Muchee fog there. Lighthouse, he shine; fog whistle, he blow; fog bell, he ling. But damn fog, he come just same."

Yes, sir, these administrative notes are the lighthouses we put up for your benefit--and we will keep on doing it, even though we know the fog is pretty likely to come just the same.

Holidays

For example, one of the thickest fogs hangs over the question as to whether the Department will close for half a day before holidays. In order to clear this fog, the National Emergency Council on January 28, 1936, issued instructions to the effect that employees will NOT be excused for any part of a day on the day before Washington's Birthday, Memorial Day, Independence Day, Labor Day, or Thanksgiving Day. However, employees who can be spared will be excused for one-half day Christmas and New Year's eves.

Whenever it is decided, on account of storms or for other reasons, to excuse employees for part of a day the bureaus are notified, the chief of operations points out in an effort to clear away another fog. Sometimes, of course, the decision is reached too late to send out written notices and the telephone is used. As a consequence the department's telephone office, the Division of Operation and the immediate Office of the Secretary are deluged with telephone calls to ascertain whether the order is official.

"It is desired at this time to make it clear," says Division of Operation Circular No. 7, dated February 10, 1936, "that no orders excusing employees are issued unless specific word has been received from the Director of Personnel or the Office of the Secretary. Hereafter employees should inquire of the Chief Clerk of the bureau or office in which they are employed, and not call the Division of Operation or the Office of the Secretary."

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., April 1, 1936 No. 7

Fruit-bud Injury. Dr. J. R. Magness and Dr. F. P. Cullinan spent three days the second week in March studying the fruit-bud injury through western Maryland and West Virginia. Peach buds west of the Blue Ridge mountains in Maryland and West Virginia were apparently largely killed by the winter cold, so that prospects in that section are for very light peach production. In certain sections there was also considerable injury to apple buds. The temperature had fallen there during one night from around 45° F. to from -9° to -11°. This cold was accompanied by high winds.

The injury seems more serious at the higher elevations and on exposed sites than in the low, protected valleys. This is just the reverse of the usual cold-injury situation. In many buds the area at the base of the flower cluster is discolored but the flower cluster is uninjured in most cases. Also, the xylem area is discolored, in many cases for a distance of 1/2 inch down from the growing point. It is uncertain at present just how much this injury will affect the setting of the fruit. Orchards in the vicinity of Romney, W. Va. were the most seriously injured of those examined. It is probable that the crop will be cut heavily in those orchards due to this injury. In the area around Hancock, Md., most of the buds showed slight injury, but it is questionable whether the injury is severe enough to prevent fruit setting.

There is no apparent injury to the wood or bark back of the buds. The injury is unusual for apples, in that wood and bark injury usually occurs before bud injury. Possibly the present type of injury can be accounted for by the suddenness of the drop in temperature. Records of the amount of bud injury in these orchards have been taken, and the set of fruit will be watched carefully this spring.

NUT PRODUCTION

Stinkbug Menaces Filberts

Writing from the U. S. Horticultural Field Station at Beltsville, Md., C. A. Reed tells us that the stinkbug is apparently an even greater menace to the filbert in the North than to the pecan in the South! "In the examination of the first-crop hybrid filberts from young trees at the U. S. Horticultural Field Station, Beltsville, Md.," he writes, "it was found in early January that an occasional kernel had black spots strikingly like those of pecan kernel spot of the South, shown by Demaree and others to be due to stinkbug puncture. Specimen material was sent by Dr. Crane to the Bureau of Entomology and Plant Quarantine and definitely found to be stinkbug injury.

"While the investigation by the Bureau of Entomology and Plant Quarantine was in progress, it was further discovered at Beltsville that a very high percentage of the filberts of standard European varieties grown at Arlington Farm, across the Potomac river from Washington, in Virginia, were extremely bitter. The kernels were almost entirely without the characteristic black spots invariable with stinkbug infestation in the pecan of the South. However, the bitterness seemed identical, and upon dissection the kernels were found to have from one to several inner areas which were more or less broken down, although these did not necessarily appear on the surface. In the light of the report from the Bureau of Entomology and Plant Quarantine, it is assumed that this trouble is due to injury by the stinkbug or some closely allied insect.

"The importance of this discovery is difficult to appraise as filbert growing in the East is not an industry. However, in view of what appears to be the possibilities within the realm of filbert breeding, there is looking far into the future. Immediately it means that at both Arlington Farm and the U. S. Horticultural Field Station at Beltsville, Md., other cover crops must be substituted for cowpeas and soybeans, both of which are favorite host plants for the stinkbug.

"Demaree pointed out several years ago that with pecans in the South it was ordinarily only the lower branches that were affected, as infestation was rare higher than 20 feet. However, with filberts, this would undoubtedly mean that the entire crop would be reached, as filbert trees seldom attain more than that height.

"Singularly enough, pecan trees near the filberts at Arlington Farm have shown practically no infestation, although given identical cultural treatment, including the use of the same cover crops. This raises several questions: Does the stinkbug prefer filberts to pecans? Does it not like the northern pecan as well as the southern? Is it the same insect?"

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VEGETABLE PROJECT AT THE U. S. HORTICULTURAL FIELD STATION NEAR BELTSVILLE, MARYLAND

Field operations were begun at Beltsville, on what is now the U. S. Horticultural Field Station, in the crop year of 1932. A considerable acreage varying from 20 to 40 acres of vegetable crops has been grown for experimental purposes on the place each year since.

Although we have had four years field experience at Beltsville, the entire local staff has been located on the Farm in the new Horticultural Building and greenhouses just a little over a year. We moved out in January 1935. At the time of the move of the offices and laboratories of the vegetable project to Beltsville, the field work was already well organized and functioning smoothly. Now after a full year's occupancy of the practically completed plant, things are going fine.

Just who of the Vegetable Investigation project of the Division are now located at Beltsville?

Dr. Victor R. Boswell, project leader.

Dr. L. L. Harter, in charge of bean, pea, and sweetpotato disease investigations. Associated with him are Miss Florence Hedges and Dr. W. J. Zaumeyer, on bean and pea diseases, and Mr. C. F. Andrus who is principally engaged in studies of the morphology, cytology and physiology of certain parasitic fungi. Members of this group also are actively cooperating with others in the project upon breeding and selection of beans, peas, and sweetpotatoes.

Dr. S. P. Doolittle is engaged in studies on virus and other diseases principally of the solanaceous and curcurbitaceous crops. Associated with him are Dr. F. L. Wellman and Mr. F. S. Beecher. In addition to disease studies as such, this group is actively cooperating with others on the breeding of disease-resistant varieties of tomatoes and cucumbers.

A. C. Foster conducts studies of physiological diseases of vegetable crops andis at present engaged in long-time physiological studies of the tomato, with particular reference to puffiness, stem end rot and poor fruit setting. He is also devoting some time to black heart and tip burn studies. Mr. Foster is assisted by Mr. E. C. Tatman.

Dr. Roy Magruder conducts the vegetable variety type studies which have been reported from time to time in the News Letter, and also has in progress genetic studies on garden beets and on lima beans. He is assisted by Mr. Robert E. Wester.

VEGETABLE PROJECT AT THE U. S. HORTICULTURAL FIELD STATION NEAR BELTSVILLE, MARYLAND.

(continued)

Mr. R. C. Thompson is engaged chiefly in studies of the genetics of lettuce, and in the breeding of heat-resistant varieties of lettuce adapted to the eastern United States. He is also engaged in physiological studies of the dormancy of lettuce seed.

Mr. W. S. Porte is immediately responsible for the execution of the tomato and cucumber breeding work which is being conducted in cooperation with Dr. Doolittle and his associates. He is assisted by Mr. Hubert B. Walker.

Mr. C. E. Steinbauer is engaged in physiological and biochemical studies, and growth and development of certain tuber and root crops, particularly Jerusalem artichokes and (in cooperation with Mr. J. H. Beattie) sweetpotatoes; also collaborates with the potato project on physiological and biochemical studies of the Irish potato. He is assisted by Mr. L. E. Barrett.

Dr. Charles Drechsler, well known mycologist, is continuing his taxonomic and morphological studies of certain fungi.

And these members of the technical staff are ably served and assisted by Miss Laura Dale and Miss Zora Cowell of the clerical staff.

PHYSICAL FACILITIES FOR VEGETABLE RESEARCH

About 40 acres of land are in current use, of which 25 are good typical sandy loam truck soils and some 15 acres grading into heavier types. A few acres are distinctly claylike. Thus, a wide and very desirable range of soil types is available for specific investigational uses. This is a situation which in this particular instance is much more desirable and more valuable than if all the soil available were of an ideal character for truck growing.

There are two well equipped, thoroughly modern physiological and biochemical laboratories, one of which also has facilities especially designed for anatomical and cytological work. There are four compact but well equipped pathological and mycological laboratories. These six laboratories are located in the Horticultural Building. There are also three less elaborate or field laboratories in the greenhouse head house and another also in the head house which is shared with other projects. A large low temperature room for incubators and mild cold storage is also shared with other projects.

DISEASES OF TRUCK CROPS

W. D. Moore, Charleston, S. C.

"We have just come through the second coldest winter on record for this area," he writes in an interesting report on conditions near his station, "and probably the most destructive one in history in so far as the truck farmers are concerned. A large percentage of the winter crops were planted somewhat early last fall and were in excellent growing condition when the first of a long series of cold periods struck on November 23rd. From that date there was little or no weather favorable for plant growth until late in February.

"In view of the fact that a wider variety of crops are now being grown than was the case in 1918 (coldest winter on record) and in view of the long periods of low temperatures during the past three months, winter vegetables suffered probably heavier losses this year than in any other winter season since the industry began in this area. The following is a summary of the weather conditions for December, January and February:

Month	Precipitation	Normal Precipitation	Mean Temperature	Mean Normal Temperature
December ...	2.72	2.72	44.6	51.7
January.....	2.54	3.02	47.1	49.9
February....	3.45	3.08	48.4	52.4

"As may be readily seen from the above data, there was little weather during the past three months in which our average crops could grow. Winter cabbage suffered more than any other crop. In many cases heads were fairly well formed when the first cold weather came, consequently losses were in evidence from that time on. Numerous fields have been plowed under without any attempt at harvest. In other cases the plants have been left standing with the hope that some will form heads when the weather is more favorable. As might be expected under such conditions, a good percentage are already 'bolting' and it is not likely that expenses can be made from the fields. Of the many varieties seen throughout this area, practically all showed severe damage from cold. However, some strains of the Charleston Wakefield showed considerably more resistance than many of the other better known varieties.

"Spinach was another crop that suffered to a marked degree from cold but the losses in this case will not be so great in view of the fact that a fair percentage of the plants will recover to a point where they may be harvested. The quality of the crop as a whole, however, has been materially damaged and few of the growers will show a fair profit as a result.

DISEASES OF TRUCK CROPS

W. D. Moore (continued)

"Several large plantings of carrots were made in this area last fall by California interests and all of these have been failures. In most cases it has been a case of cold weather, although cultural methods may have played some part in the losses. In all cases to date, the need for better adapted varieties of all vegetable crops for this section is strongly emphasized.

"Regardless of the repeal of the potato control law, the total acreage of potatoes is somewhat less in this section this season as compared to last. Many growers are disappointed in this crop and are reducing acreage upon their own initiative. A noticeable change has occurred in general practice, however, that should change losses to some profit in the future. More attention is being given to fertilizers, deficiency troubles, and diseases than ever before. These changes should certainly increase yields and lower per acre costs to a marked degree.

"The acreage of spring cabbage and other spring crops will be about the same this year as was the case last season. More beans are being planted in the border sections of the trucking area, but the principal coastal acreage will be about the same as last year. As in the past, almost all of our growers are specifying western seed. Much credit should be given local seedsmen for their efforts along this line, all of which helps materially in holding down diseases on this crop.

"Plantings of beans were made as early as March 2nd. In the Charleston area this season, however, this was not general. Some planting will continue until after the middle of March. Interest in this crop is shown by the many requests that we get from all sections of the trucking area for information on varieties, fertilizers, methods of planting, etc.

"We made our first field planting of beans on March 9th, and interval plantings will continue until after the first of April. Since our seed treatment work was completed last spring, more attention will be given this season to varietal studies, influence of fertilizers on root rot, dates of planting, and mosaic studies. A new series of about fifteen hybrids and varieties new to this area is being started."

NUT PRODUCTION AND DISEASES

B. G. Sitton, Shreveport, La.

"The weather has been very warm and pleasant during the entire week and it seems that spring is here," he writes for the week ending March 7th.

"Peach, pear, and plum trees were in full bloom during the week. Many of the flowers and shrubs were also in bloom. As yet the pecan trees show no signs of initiation of growth except that large trees which were cut down do exude sap from the cut stump.

"A trip was made to Bunkie in order to look over a pecan planting in view of establishing an experiment. However, these trees had been planted at a distance of about 50 feet nearly forty years ago and were entirely unsuitable for any experimental work. The owner was advised that he could not expect production from these trees unless they were given more space and that even then a production probably would not be as high as other orchards which have had more space from the beginning. He plans to remove half of the trees. The trees are of a Frotscher variety.

"Seventy trees in the cultural plot in the J. H. Fullilove orchard were cut out during the week."

J. R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on March 7th, he reports that Dr. Weimer, pathologist, and Mr. Bissell, entomologist, of Experiment, Ga., called early in the week. Dr. Weimer was interested in the condition of the Austrian peas in the Taylor orchard and found a high percentage badly affected by stem rot fungi.

"Twigs were collected from Delmas trees and the scab stroma were examined for sporulation. However, the stroma were still dormant. On Saturday, microtome sections were made of the nursery blight fungus."

Howard E. Parson, Shreveport, La.

"Almost the entire week ending March 7th was spent transplanting bunchy water hickory or seedling pecan trees from low woods near the Bollinger orchard to upland soil on Mr. Baloom's place near Greenwood. A total of 12 trees have been transplanted....The tap roots of a number of trees have been attacked by borers. However, borers were not found in the roots of all of the trees dug. The bark of two bunchy trees that were dead was found split by fungous growth slightly above the crown. ....Although flecks as described for phony disease of peaches have been observed in the stems and roots of bunchy trees, affected roots and stems have not so far responded to the test used to determine the presence of phony diseases in peaches."

FRUIT PRODUCTION

E. C. Hughes, Davis, Calif.

"The apricot collection shows some interesting varietal differences in amount of bloom," he writes March 7. "A few varieties, mostly among the latest to bloom, came out almost normally, while most of them have opened only a very small percentage of bloom and that has come out over a considerable period of time. Unfortunately, all the important commercial varieties have bloomed poorly in all districts from which reports have been received, hence it would appear that the 1936 crop will be a relatively short one.

"The apricots are mostly past full bloom now and nearly all the crosses planned have been completed. Some of the crosses were restricted in number due to the poor bloom, but at least a few pollinations were made in each.

NUT PRODUCTION

Max B. Hardy, Albany, Ga.

"The weather for the week remained sunny and warm," he writes for the week ending March 7th. "The vetch cover crops are now beginning to look like cover crops.

"Peaches are in almost full bloom, pears have about finished blooming, and now have leaves about half grown. Native plums are in full bloom. Japanese persimmons are showing about half an inch of bud expansion, kudzu is beginning to grow, and many forest trees have a green cast. Swelling of pecan and chestnut buds has not yet been noted, although another week of weather similar to the past week should cause them to begin growth."

Milo N. Wood, Sacramento, Calif.

Writing of the week ending March 7th, he says: "The week was largely taken up with field work. An attempt was made to finish pollination and blooming data on the almond so far as possible.

"The weather has improved somewhat from a pollination standpoint, and it is probable that there will be a set of fruit from the late blooming varieties. As stated in the last weekly report, I am of the opinion that the almond crops upon all commercial varieties except the very late and very early bloomers, will be very small this year because the weather conditions were such that the bees could not work to any great extent during the pollination period."

TOMATO HYBRIDS

Fits like a Glovel! They are telling a story around the Department of a visitor who stopped at the Information Desk to ask about points of interest. He was given a number of suggestions and the information clerk added that before the visitor left the building he should go up to the second floor to see the Gilbert White 40-foot mural. She had forgotten about him when a telephone call came some minutes later from the Bureau of Animal Industry and an indignant voice inquired: "Who sent this man up here looking for a 40-foot mule?"

I think it is quite a tribute to the Department that the visitor went in search of the mule. His knowledge of our work led him to believe that such an animal was possible. Why not? We have been turning out 40-foot mules horticulturally for years. There's the Glovel tomato, for example, which runs to about 45 feet, figuring the Marglobe at 40. William S. Porte, H. S. Wolfe and W. M. Fifield tell us about this new hybrid, developed in cooperation with the Florida Agricultural Experiment Station, in Circular 388, "The Glovel Tomato," just issued in the Department's series. The Glovel has been outyielding the Globe and Marglobe at Homestead, Fla. in tests extending over several years, and has shown that it is well adapted for use as a high-class shipping tomato especially in those areas where the soil is infested with fusarium wilt or in sections subject to outbreaks of nailhead rust. An interesting feature, specifically worked for in developing the hybrid, is its open type of growth which makes it easier to spray and pick the fruit. The mature-green fruits can be seen readily by the pickers and not only is time saved in picking, but fewer fruits are overlooked--and the fruits are more likely to be uniformly picked at the right stage of maturity.

But I wouldn't fool you, even on April 1. It takes time and effort to create these disease-resistant tomato hybrids. It can be done, it has been done, and we are doing it--but - "control measures take time and money," says a press release on the subject, "can never be effective on an entire crop and are quite ineffective in controlling wilt and mosaic diseases. The breeder cannot produce a resistant variety until he finds a plant with some capacity for 'resistance'. The search may lead to remote corners of the world. Resistance may be evident. It may be obscure. Once found, breeding stocks uniform for 'resistance' should be developed. If these uniform strains are not good commercial varieties, the breeder must use them as parents to cross with varieties of desired commercial qualities. Successive selections from hybrids must then be carefully made and tested to make sure they breed true for resistant and commercial characters. This is slow work, because many generations with thousands of plants usually must be grown before desired characteristics are fixed in a variety that breeds true for the desired vine and fruit type, and for resistance to a specific disease or diseases."

FRUIT DISEASES

M. A. Smith, Springfield, Mo.

Writing from the Ozark Fruit Disease Laboratory on March 7th, he reported: "Several trips have been made through the district during the past two weeks with the object of noting the condition of the fruit buds. Condition of peach buds is about the same as given in the last report--Elberta and Hale, 20-25 percent live buds. In other varieties, which include Red Bird, Alton, Champion, Krummel, Wilma, Mikado and McGraw, live buds average 30 percent.

"At the Mountain Grove Station the plum varieties all carry a high percentage of live buds. Grapes at the station have come through the winter in excellent condition. It is apparent that a good many cherry buds were killed by the low temperatures but there should still be enough remaining for a good crop.

"Apple varieties show considerable variation as to numbers of fruit buds. Jonathan seem to have a good crop of buds generally; Golden Delicious, fair to good; Winesap, light; and Ben Davis, fair to good. As far as we have been able to determine, there has been no winter injury to apple buds in the district. Further examination of apple and peach wood has shown no winter injury present."

H. F. Bergman, Amherst, Mass.

"Analyses are now being made of some cranberry vines which were grown for only three or four days in solutions of copper sulfate of different known concentrations," he writes from the Cranberry Disease Field Laboratory on March 7th. "In most of the series of vines from this experiment we have been able to account for 90-99 percent of the copper sulfate used in the culture solution, which we had not previously succeeded in doing.

"We had about two inches of snow here Thursday afternoon and night. At the same time the cranberry region on the Cape had rain. There has been less snow in the cranberry district than at Amherst, but the winter in both areas has been normal in both temperature and snowfall."

Writing on March 14th, he says: "Many of the cranberry seeds planted during the last week of February are now germinating, and in these lots germination appears to be 90-100 percent.

"We had rain all the week until Friday. Temperatures have been fairly high and with the rain a large part of the snow has melted, causing some rather bad floods locally."

FRUIT DISEASES

John C. Dunegan, Fayetteville, Ark.

"Somewhat colder weather prevailed this week, with the termometer dropping to 30°F. during the night of March 11," he writes March 14. "A light rain fell during the night of the 10th, but more rain is urgently needed,

"Additional specimens of measles on Bosc pear twigs were received from Dr. Aldrich and I have succeeded in isolating bacteria from the very small young papules. The work with the pear measles material has occupied much of my time during the week.

"The basidiomycete isolated from stem cankers on Hilger apples last fall has finally been determined as Schizophyllum commune. The fruiting bodies which have developed in culture are not quite typical of the fungus as it occurs naturally in the vicinity of Fayetteville, the main variation being a slight difference in the abhymenial hairs which develop on the upper side of the gills at the tips. Dr. D. A. Linder, in a monographic treatment of the genus (American Journal of Botany 20:552-564, 1933) placed considerable stress on these abhymenial hairs so I sent him a number of my specimens for authentic determination. His reply, received during the week, indicates that while my specimens do have short abhymenial hairs, the general characters place the fungus as S. commune rather than S. radiatum, a species to which I thought it might be referred."

----------ADMINISTRATIVE SPECIAL----------

Salary Checks

Once upon a time there was a man who placed his money under his pillow each night--but he hadn't enough to retire on.

From what our field men write us--with due regard to the limitations placed by the Post Office Department upon their language--they often do not have anything to put under their pillows. Their salary checks arrive next morning--or later.

The Business Office has attempted to explain the new setup--the centralization of all check writing in the Treasury Department proper, etc. And we are doing everything we can to help work out ways and means of expediting the issuance of checks. In the meantime, however, we have found that in come cases certifications are being received here as much as six days after the pay date. Please make it a point to send these certifications promptly at the end of each pay date. Choose the best medium at hand--the Army and Navy radio, if either is available--provided there is no cost to the Department, as this subject is considered intimately personal! If you do not mind paying the postage, air mail speeds up things, too. But at any rate, please make every possible effort to get the certifications to us promptly.

ADMINISTRATIVE NOTES

Gasoline Contracts

Roy Gillette is going to be plenty surprised to see this note-because he thinks it was in the March 15th issue! Unlike the man who gave up his seat in the street car to a pretty girl--it was not crowded out for more interesting matter. It just happened to get in after the March 15th material had been mimeographed and was being assembled and stapled. Or are you interested?

Anyway, a question has arisen in connection with prices to be paid on gasoline contracts that have been obtained by the Procurement Division and are effective at many of our field stations. In most cases the bidder has offered a reduction of from 1 to 3 cents a gallon from the posted service-station price or posted tank-wagon price, and has also stated a maximum price per gallon which payments on his contract are not to exceed. Some field employees of the Department have interpreted these clauses in a manner that would prevent payment at a rate per gallon in excess of the maximum price stated less the contract deduction. This method of figuring is wrong.

As an example, if the contract rate is 2 cents a gallon less than the posted price and the maximum price is given as 14 cents a gallon, then it would be permissible to pay any rate per gallon under such contract insofar as the net price per gallon does not exceed 14 cents after the contract deduction of 2 cents is made. In other words, the posted price could be 16 cents a gallon, less 2 cents per gallon by contract; but could not exceed this rate.

Automobile Mileage Allowance

The Comptroller General, in a decision to the Public Works Administration, has given a ruling that may have bearing on travel performed by members of our Division. The case involved concerned an employee to whom a letter of authorization was issued providing for travel by personally-owned automobile, with an allowance of 5 cents a mile, not to exceed cost by common carrier.

The authorization provided for travel by the employee only; he was not authorized to take any one with him. However, he did take along another employee on the trip, and when he turned in his expense account he claimed the full rate of 5 cents a mile on the basis that it was less than the cost of common carrier for the two persons.

The ruling of the Comptroller General calls attention to the fact that the authorization was for one person, and that consequently payment may not be made for an amount in excess of common carrier cost for one person by the shortest practicable route.

ADMINISTRATIVE NOTES

Radio-telegrams A man was telling a friend of the strong impression he had made on a business man he met at the Conference. "He told me he could use a head like mine in his own business," he said. His friend looked doubtful. "I don't believe that is much of a compliment," he commented. "He is in the concrete business." Well, anyway, we don't want you to get the idea that we haven't a proper appreciation of your intelligence--repeating these administrative notes so frequently. If you ever read them, you will notice that there is always a difference that may mean money to you.

For example, under date of December 31, 1935, the following circular letter was addressed by the Comptroller General to the officials of the departments, independent establishments, and others concerned:

"The attention of officers and employees of the Federal Government should be directed to the fact that radio-telegrams may be transmitted between many of the large cities of the United States more cheaply than telegrams. In order that there may be full compliance with the well established principle of utilizing the most economical service available, which is for general application and observance by all who are authorized to incur expenses chargeable to public funds, care should be exercised to see that messages are transmitted by the most economical method."

Well, we have gone into that pretty thoroughly in previous issues of the NEWS LETTER, but the Acting Comptroller General, under date of March 9, points out that the attention of officers and employees should also be directed to the fact that there exists in many States a decided difference in intra-state telegraph rates offered by the several telegraph and cable companies, which rates should likewise be taken into consideration in order to utilize the most economical service available in the transmission of messages.

Tax-Exempted Purchases. The Ford Motor Co. has reported that some Government agencies are withholding payments from authorized dealers for Ford parts purchased under Contract TPS-7807, for the reason that the dealers have not deducted from the contract price an amount equal to the excise tax. This contract (A Precurement Division, Treasury Department Contract) was executed prior to August 30, 1935, when the amendment to the Revenue Act provided for tax exemption on certain articles purchased for the exclusive use of the United States, so it is permissible to allow the tax to stand as the contract prices include the tax. Not statement "Prices do not include," should accompany bills of this type. In other words, on contracts based on bids opened prior to August 30, 1935, bids including stipulation that the prices included Federal tax, payment should be made at the contract price and no tax exemption certificate used.

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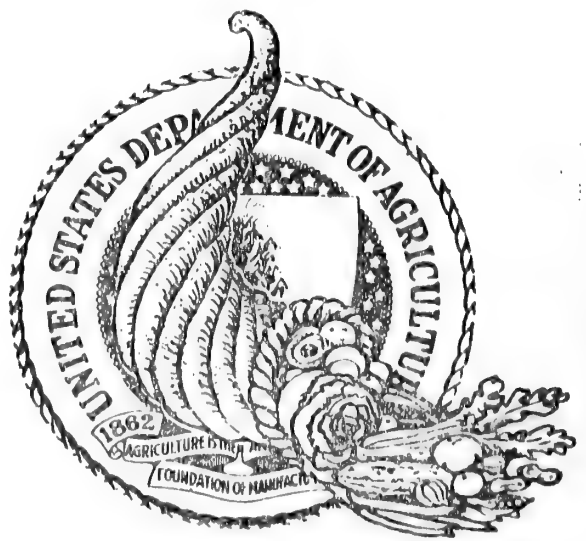
THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER



BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

This NEWS LETTER is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. VIII Washington, D.C., April 15, 1936 No. 8

All in the Day's Work

In a talk before one of the classes of the Department's Graduate School, Dr. Leonard D. White, member of the U. S. Civil Service Commission, and formerly professor of public administration at the University of Chicago, remarked that the Department has the reputation of being one of the most progressive and most intelligently managed of all the departments of the Government. It is true that Dr. White said "has the reputation," instead of "is one," but why split hairs? Besides, it is a lot more difficult to get a reputation for being efficient than it is to be efficient.

Well, Milo N. Wood isn't doing anything to hurt the Department's reputation in that respect. In his report for the week ending March 14, he writes: "We are finding quite a large number of almond orchards not containing proper interplants of varieties for pollination purposes. Considerable time has been spent lately advising growers how to correct this error." Here, you see, is another illustration of our somewhat intangible service--service that doesn't usually show up in reports on research activities. Growers appreciate its value, however, and realize that it quite often marks the dividing line between success and failure--and on such knowledge is the Department's reputation solidly built.

The Department is an instrument of service and as such does not aim at profit in the direct manner a business concern would, but the very nature of our work makes it certain that an amazing dollars-and-cents return will be made on the investment. As with the Federal service in general, too, we supply from top to bottom the true soldier's ideal--that great deeds may be done without hope of personal reward, present or future. It's all in the day's work.

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

"The Pacific Northwest Advisory Board carried out a series of demonstrations of developments in automatic car heaters in Wenatchee, Yakima, Hood River and Medford," says an anonymous report from Wenatchee for the March 1-30 period that we are charging to Ed Smith, in view of his past offenses. "This was followed up with a demonstration before the Agricultural Council at the Advisory Board Meetings in Portland on March 26, at which we were present.

"The fresh fruit committee considered the next steps to be taken to secure an extension of 'heater territory' contingent upon the perfection of automatic heaters. The general desire of the committee is for a single protective service, regardless of weather, under which the carrier would undertake to provide temperatures within a reasonable range of 32° F. We may expect the future efforts of the shippers to be exerted in this direction....

"We have been gratified with the spread of interest in a program for Delicious conservation. If the industry were well organized the application of our storage results would be comparatively simple. As it is, we are hopeful of making all components of the industry 'Delicious conscious' through (a) local horticultural or fieldmen's associations and (b) through the State extension service. We believe these are good possibilities of having county agents adopt Delicious conservation as a major project. Such cooperative organizations as now exist undoubtedly will consider adopting a definite policy with respect to Delicious apples distinct from operating plans affecting other varieties.

"The weather in eastern Washington has resulted in a late spring. The catkins on the poplar trees adjacent to our laboratory are two weeks behind 1935, and are 10 days in arrears of any season since 1931. Night temperatures still go as low as 24°F."

W. T. Pentzer, Fresno, Calif.

"On January 10 an exhibit of the experimental packs was held at the Fresno laboratory and there was an attendance of about 60 or 70 shippers and representatives from storage firms," he writes in an interesting report of activities during recent months. "The writer was in the hospital at the time of the exhibit, recuperating from an operation for appendicitis, and upon Mr. Asbury's shoulders was placed all the work necessary to prepare samples and put on the exhibit.

"Gray mold was a real factor in last season's grape storage and much interest was evidenced in our control experiments in which sulphur dioxide was applied to the grapesby various methods. The value of sulphur dioxide in keeping mold growth checked in storage was clearly demonstrated by our experimental packs. The fruit fumigated with

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASE INVESTIGATIONS

W. T. Pentzer (continued)

sulphur dioxide in refrigerator cars was free from mold for a much longer period than the untreated fruit...In most cases the fruit packed with a small amount of Sodium Bisulphite, either in the pad or display lugs or mixed with the sawdust in sawdust packs, was slightly better than the fruit fumigated in the usual way.

"This season Emperor grapes went into storage in rather an immature condition due to the combination of late season and early rains and frost which forced the growers to pick their fruit to save it. This immature fruit takes up sulphur dioxide more rapidly than mature fruit and we found this season that 5 grams of Sodium Bisulphite was about all that could be safely applied to the package, whereas in previous seasons 10 grams were used without serious difficulty.

"While rainfall during the last three weeks has been subnormal," he continues, writing under date of March 20th, "the season rainfall is about 2 inches above the normal and a heavy snowfall in the mountains assures adequate irrigation water for next season....Most fruit trees have finished blooming and grapes are now showing their leaves...The weather since the first of the year has been above normal and everything points to an early season."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending March 28 was spent largely in taking results of some filbert blight infection studies carried on during the winter and spring under greenhouse conditions," he writes from the U. S. Fruit Disease Field Laboratory. Among other things, these results indicate that the presence of moisture is necessary for infection to occur. Only a very short period of continuous wetting was found necessary, though, for infection to occur. As little as 15 minutes of continuous wetting after inoculation resulted in a limited amount of infection....Blight infection can apparently take place over a wide range of temperatures, as lesions were produced on young inoculated leaves which were subjected to inoculation temperatures ranging from 10°C. to 30°C.

"Last fall, just before the leaves dropped, I inoculated some filbert buds in the axils of the leaves on shoots on potted filbert trees in the greenhouse by spraying with pure water suspensions of the filbert blight pathogene. A number of the buds so inoculated have turned brown and have failed to open this spring. The results of this study afford additional evidence that infection of buds occurs in the fall and explains why a bordeaux application in the fall is effective in reducing the incidence and severity of blight."

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"The weather has been very warm in the daytime so that growth is coming along quite rapidly, especially with the filberts," he writes March 21st. "Observations would indicate that the Barcelona has suffered quite severely from the winter freeze so that a good proportion of the pistillate flowers are killed in some orchards. In the same orchards the later blooming varieties are showing a heavy bloom. This would indicate that there was a considerable difference in the stage of development of the pistillate parts at the end of October, 1935."

He had written a week earlier: "A partial survey of winter injury on walnuts shows the damage to be much more widespread and extensive than at first indicated. Orchards at an elevation of 800 feet are showing the same type of injury as orchards on the river bottom at 250 feet. Of course, the orchards on the river bottom have more injury but of the same general type. The killing of trees is practically restricted to those 8 to 10 years of age and younger. One interesting thing is what might be called selective killing in the older trees. A branch that is crowded or pinched may be completely blackened, while other branches in the tree show little or no damage.

"One orchard top-worked 5 years ago on black walnut trees showed what would be estimated as a 100 percent kill on about 250 trees--all the trees in the planting."

Reporting for the week of March 23-28, he writes: "The weather has been very cool, most of the time quite rainy, and at present we have a heavy snowfall in the surrounding hills. It is a decided drop in temperature compared with what we have had.

"Evidence of winter injury is becoming more widely spread. We have just received a report stating that in one section chestnut trees have been hurt quite severely. We saw some limbs from prune orchards in which a definite killing had occurred on growth 3-4 years back from the tip. The outer portion showed practically no evidence of injury except a slight discoloration in the wood below the buds."

B. G. Sitton, Shreveport, La.

"Rainfall has been deficient here during the entire winter and streams and bayous are lower than we have previously observed at this time of the year," he reports under date of March 21st. "The soil is not well supplied with moisture and unless more rainfall than usual occurs during the growing season there may not be sufficient moisture for crop production."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"During the week pecan trees in the orchards made their first real advance in growth," he writes on March 28th. "Most of the outer brown bud scales were pushed off on the earliest varieties, and the inner green scales have lengthened to about one-half inch. A few seedling trees were found with catkins showing, some of them 1-1/2 inches long. Such varieties as Stuart are as yet showing very little growth."

Discussing weather conditions in an earlier report, dated March 21, Dr. Hardy reports typical March conditions. "Rainfall totaled about 1.5 inches and three days were very windy, but fairly warm and bright." Then he advances one of those startling theories that crop up occasionally in research studies: "I am convinced," he writes, "that among the superstitions of this section one should be found that the spreading of commercial fertilizer is the best way of calling up a strong breeze. The data obtained this year is very convincing."

Oh, I suppose there will be scoffers, but what we need in the field of research--pure, applied, and misapplied--is an open mind in attacking scientific problems such as this. I had this impressed on me last winter. A State experiment station worker who specializes in fish and diseases of fish, has a friend who fills a supervisory position in the local insane asylum not far away--a fact that, in a way, appears to justify my using this story under "Nut Investigations." Anyway, the friend's hobby is gold fish. In fact, his whole family is interested in them. So when the folks went on a trip and left him in charge of the fish, he was dreadfully upset when three of them died.

Feeling his responsibility and not knowing what else to do, he called up his friend at the station and asked him to come out and diagnose the trouble. It was a very cold, snowy, December evening, but the professor got out his car and went up to the asylum, looked over the fish situation, wrapped the three dead specimens in his handkerchief and put them in his pocket to take back to the laboratory for examination. On the return trip snow collected on the car's windshield so thickly the professor had to get out to remove it. When he took his handkerchief out of his pocket to do this, the goldfish fell in the snow. As he was looking for them, a motorcycle officer came along, stopped, and inquired what he was looking for.

"Gold fish," said the professor, without looking up.

A startled expression came over the officer's face, but happening to glance up at the asylum he thought he understood. He suggested that the professor come along with him, and when the latter protested, began to use a little force. At that very moment the professor caught sight of one of the gold fish, picked it from the snow and held it up before the eyes of the astonished officer. After some seconds of stunned amazement, the officer gasped: "I guess I'd better go along with you."

DECIDUOUS FRUIT INVESTIGATIONS

Leslie Pierce, Vincennes, Ind.

"Several peach orchards have been examined to determine the amount of damage to trees caused by the abnormally low temperatures the latter part of January," he writes March 17th. "It was found that the severity of the injury varied greatly in the orchards examined. In the Knox County Home orchard (formerly the Purdue-Vincennes orchard) where the vigor of the trees has been maintained by pruning, cultivation and the application of nitrates, the injury to the wood appears to be not more than half as severe as that caused by the freeze in January, 1930. No loose bark has been found on the trunks or in the crotches of the trees. In 1930 the bark was loosened on the trunks of practically all trees and many of the crotches were badly injured. The trees in this orchard were heavily headed back following the freeze in 1930, and again following the loss of the fruit crop from a late spring frost in 1932. Moderate pruning was practiced in 1931, 1933 and 1935. The trees received no pruning in 1934, the year the orchard was turned over to knox county. They are 12 years old.

"In an orchard of 12-year-old peach trees located 6 miles east of the Knox County Farm the damage from the January freeze is particularly severe. Practically all small growth is dead, and wood of limbs up to 4 inches in diameter much discolored. It was estimated that less than 1 percent of the leaf buds were alive. The ground the trees are set in has a good elevation but a moderately tight subsoil. The trees have never had other than light pruning and the fruiting wood last season was well out on long, leggy limbs. Prof. Burkholder advised the owner of the orchard to apply sulphate of ammonia, 3 pounds per tree, and to delay pruning until growth starts, in an attempt to save the trees.

"The third orchard examined is located one-fourth mile from the second, with slightly higher elevation and about the same type of soil, the trees being 6 years old. The bark has been loosened on the trunks of about 80 percent of the trees and crotch injuries were fairly numerous. It was estimated that about 1 leaf bud in 500 was still alive. The tops of these trees have never been renewed by moderately heavy heading back. In a 30-acre orchard of Hiley near Vincennes the injury is so severe that it is doubtful if many of the trees survive. This orchard was so severely injured in 1930 that about 30 percent of the trees had died previous to the freeze in January, 1936. In none of the orchards examined was there any evidence of living flower buds.

"It is reported that most of the orchards in Union and Johnson counties in Illinois will have almost a full crop of peaches. North of a line drawn from Harrisburg to Carbondale the peach crop was completely destroyed. South of Union and Johnson counties the crop will be light. Paducah, Ky. also reports prospects are for very light crop. A grower in the Henderson, Ky. section reports prospect of from 30-65 percent peach crop. Mr. John E. Roberts, Jr. of White Hall, Ark. in a recent letter reports that the present outlook is for a full crop in the Crowley Ridge peach section."

DECIDUOUS FRUIT INVESTIGATIONS

E. V. Shear, Hood River, Oreg.

In a report on Hood River condition for the March 8-14 period, he writes: "In the Parkdale district where potatoes are one of the principal crops, production of certified seed is also important. Many growers lost all or the principal part of their crop in the freeze last fall, while others found that after digging the tubers developed hard internal cork around frosted portions completely ruining the stock for cooking. There remained hope that something could be salvaged from such stock if it could be used for seed as there is prospect of great demand for seed this year, with heavy frost damage in other districts also. A recent Yakima report states 3,000 cars were frozen there.

"Where Parkdale tubers have not been frozen so badly that they rotted, germination has been satisfactory and apparently normal growth has followed in plants carried five weeks after emergence. Corvallis truck crop specialists believe this stock suitable for seed. There remains some question whether tests have been adequate. Owners of this stock are informing buyers what has been done and the stock is sold at some discount and without guaranty....

"At Hood River and Underwood where both peaches and apricots are scarcely commercial, February freeze damage varies widely depending on location and variety. Nearly all fruit buds and leaf buds are dead with terminal growth killed back into 2-year wood on some trees; others show inconsequential damage. A few examinations do not justify appraisal of general conditions. However, growers feel damage is large and severe.

"Sweet cherry bud and wood damage varies similarly. This important crop is heavily damaged at its upper limits at Odell, 1000 to 1200 feet elevation. Lower valley damage is small, insignificant in many orchards. Tops are shriveling on young apple and pear trees above girdles of the early freeze. Shriveling was first found December 9th at Yakima; January 23d at Hood River. It has rapidly increased during the past three weeks of moderately dry, mild weather. It is worse on 2-3-year-old scion wood on the thousands of young trees propagated on hardy stocks within the past three or four years where scion wood is killed back to the graft or bud union....This week two orchards were found badly damaged at lower elevations than where any other heavy damage was previously found.

"At 1200 feet elevation near Odell, three-and five-year-old Newtowns are, respectively, about 90 and 75 percent dead. Two pounds of Cyanamid were used in the spring and in August very heavy growth of ferns led to heavy cultivation. This in turn forced heavy irrigation because of the difficulty in discing soil with so much vegetation in it. Fortnightly watering and discing continued until the freeze at the end of October....."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"Apparently the full extent of our early fall and winter freeze is now evident," he writes March 24th. "Considerably more injury has shown up since the low mid-February temperatures than existed before. The most serious effect of the October freeze showed up on the young trees not yet in bearing, evidencing itself mainly as trunk and crotch injury, although some of the tall succulent growths were killed back somewhat. Trees in a vigorous growing condition late in the fall exhibited a more serious type of injury and many were killed outright. It was possible to spot the trees showing the greatest amount of damage by noting the amount of foliage remaining on them after the freeze. Invariably those still having leaves were badly injured.

"As stated before, very little serious injury was found on the older bearing trees. However, since the zero temperatures of February many of the older bearing trees are showing considerable damage. This is particularly true of the later districts. In the Wenatchee district proper, bud injury is relatively slight, in fact I do not look for a great reduction, if any, in the apple tonnage from our immediate area.

"On the other hand, sections along the Wenatchee River from Cashmere west, including Dryden, Peshastin and Leavenworth, and the upper districts of the Entiat and Methow valleys, are now exhibiting injury to the extent that the crop will be seriously lessened.

"In these districts trees of all varieties which did not have their fruit picked at the time of the October freeze have practically no uninjured buds whatever. Spurs are killed back and the tissue is water-soaked. Romes show the greatest injury, followed perhaps by Staymans, Spitzenburg and Jonathan in the order named as to susceptibility to winter injury.

"Delicious showed the greatest resistance. We interpret this to be due to the fact that they were harvested earlier, in addition to the inherent natural hardiness.

"I observed dead tissues extending from three inches to three feet in back of the bud where there is little hope of recovery. Buds in many cases remained green, but are completely desiccated. These, I judge, were killed in February, rather than in October."

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

"The scorch disease of strawberries is not showing up much as yet," he writes from the Coastal Plain Station on March 20th, "as the optimum temperature for its development is somewhat higher than that of the leaf spot fungus. In our spraying experiment on the variety Bellmar there is a marked difference now in the amount of scorch in the unsprayed rows, as compared with the rows sprayed four times at about monthly intervals last fall. The sprayed rows are practically free of scorch at this time."

W. W. Aldrich, Medford, Oreg.

Writing on March 2d, he said: "Following the wet snow on Monday and Tuesday and 30° F. minima for three nights, the weather cleared to give warm, sunny days. Saturday the maximum air temperature was 63° and Sunday 71°.....

"The auction price of Anjou has dropped about 20 cents a box, but should rise again with improved weather conditions in the East. It is of interest to note that well-packed Bartletts from Argentine, now reaching New York in quantities varying from 300 to 2,000 boxes per week, are being purchased by fancy fuitiers in preference to half-boxes of the best quality of Rogue River Valley Anjous. Apparently growing conditions in Argentine are such as to provide good shipping quality and flavor of Bartletts."

Elmer Snyder, Fresno, Calif.

"With a temperature of 33° F. on our thermograph, and lower in the vineyard, serious frost damage occurred on those varieties which were out over several inches," he writes March 25th, in a preliminary report on the situation. "The Sultanina, Black Monukka, and Malaga had the shoots injured severely, and 90 percent or more of the growing shoots on these varieties were killed. This will practically eliminate the fruit on these varieties.

"Our seedlings which were well advanced were also badly damaged. I have no reports from commercial vineyards as yet, but since many of the vineyards were further advanced than our own vines, the damage especially on Sultanina vines, has undoubtedly been sufficient to greatly reduce this season's crop. As usual the frost injury even on the same vine has been spotted. Cases were noted where on the same vines one shoot escaped while 10 or 12 others were completely frosted. Nature has taken a hand in crop control !"

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

Writing from the Fruit Disease Laboratory on March 21, he says: "The bacterial cultures isolated from the Bosc pear measles material have been purified and the organisms are being grown on various media to gain information concerning their physiology and probable identity. Ten small Bosc pear trees have been ordered from a nurseryman and inoculation experiments will be started after the trees arrive....

"Specimens of Tranzschelia pruni spinosae forma discolor on almond leaves were received from Dr. Lee M. Hutchins. He collected the specimens at Beaumont, Calif. on March 12, and the spores were viable when they reached me on March 15, so we started an inoculation experiment with the material.

"Overwintering apple leaves collected from beneath trees known to have had scab in 1935 were examined very carefully for signs of perithecial production. No signs of perithecia were noted on the 279 leaves examined, even though all the leaves showed overwintered scab lesions."

M. A. Smith, Springfield, Mo.

Writing from the Ozark Fruit Disease Laboratory on March 28th, he says: "Examinations have been made of overwintering apple leaves during the past two weeks to determine the progress of perithecial maturation. Red Delicious leaves were examined in which perithecia showed signs of maturity, though ascospore delimitation had only begun in most examined. On this date in 1935, 65 percent of the asci contained mature ascospores.

"This section was the scene of a destructive wind and hailstorm on March 23. The storm apparently originated about 50 miles southwest of Springfield. At Marionville, which was in the direct path, hail fell at such a rate and in such quantities that it covered the ground to a depth of four inches. An inspection of the Harlan orchard, where the scab spray experiment has been carried on for the past four years, showed that the hail had not only knocked off the fruit buds but had caused very severe damage to the wood of the trees. Considerable damage was done to other orchards in the Marionville district and as a result, this season's scab spray experiment will be carried on at the Missouri State Fruit Experiment Station at Mountain Grove.

"A trip was made to Mountain Grove on Thursday of this week. Peaches and plums are now in bloom. Apple buds are beginning to expand."

VEGETABLE BREEDING LABORATORY

"A vegetable breeding laboratory, the first of its kind in the world, has been established by the U. S. Department of Agriculture and 13 cooperating States near Charleston, S. C." says a press release of April 2.

"'The purpose of the laboratory,' says Dr. E. C. Auchter, principal horticulturist, and assistant chief of the Bureau of Plant Industry, 'is to breed high quality, disease-resistant vegetables adapted especially to the southern States.'

"Experimental work is centered at the laboratory on land acquired near the South Carolina Truck Experiment Station. Dr. B. L. Wade, senior geneticist of the Bureau is in charge of the laboratory. Materials produced there also will be tested in all of the cooperating States, the central laboratory thus acting as a focal point for coordinating this activity in the region.

"Vegetable varieties from this and other countries will be used in breeding work. To obtain hardy and disease resistant vegetables not found in this country, as well as several other kinds of plants, expeditions under the direction of the Division of Plant Exploration and Introduction are en route to India and to Persia and Turkey. Excellent breeding materials have been obtained from these countries in the past.

"States cooperating are Virginia, Georgia, Florida, Alabama, Mississippi, Tennessee, Louisiana, Kentucky, Oklahoma, Arkansas, Texas, and the Carolinas. The laboratory was set up under the Bankhead-Jones Act, passed last June by Congress, which authorizes the Secretary of Agriculture to establish laboratories for the investigation of regional agricultural problems."

---------- ADMINISTRATIVE SPECIAL ----------

Carbons of Transportation Requests

We continue to have trouble over the failure of workers to send in the carbons of transportation requests promptly. These should be sent in just as soon as requests are used, for they are needed by the accounting officers in checking up the bills rendered by the transportation companies. A bill including hundreds of items may thus be held up indefinitely because of the non-receipt of one or two of your carbon copies. And in the meantime we hear plenty from the Bureau's accounting officers on the subject, criticism which ultimately does you no particular good, since this is one of the cases in which the blame is automatically placed on the right doorstep.

ADMINISTRATIVE NOTES

Certifying Vouchers--Responsibility. While there are many questions which will need to be clarified in connection with the centralization of check writing, etc., in the Treasury Department, it should be emphasized that the change in no way lessens the responsibility of employees who certify vouchers for payment; they are still to be held financially responsible for improper expenditures resulting therefrom. In this connection a paragraph from the Comptroller General's decision of May 7, 1934, is repeated:

> "So far as the accounting officers of the Government are concerned the primary and direct action required by law is upon the disbursing officer who, usually, is bonded; and while the responsibility of the disbursing officer and his surety in their liability to the United States, where it is shown that an erroneous or illegal payment was caused solely by an improper certification as to matters not within the knowledge of or available to the disbursing officer, the accounting officers of the Government may and will raise a charge directly against the certifying officer for the amount of such erroneous or illegal payment."

Liability to the United States for improper payments, in other words, attaches to the certifying officer involved in the particular transaction, who is authorized to incur obligations on behalf of the United States--this ruling was made in the case of an overpayment of $91.88, the certifying employee being directed to make refund. "Whether she is able to collect from some subordinate employee administratively considered as being responsible or from the person to whom the erroneous payment was made is a matter between them," rules the Comptroller. The same rule has been stated regarding the relation between a disbursing officer and his subordinate. Liability attaches to the authorized certifying officer, who is made responsible for the acts of his subordinates; meaning that when you are given authority to certify accounts for payment, the buck cannot be passed!

Payment for Saturday Half Holidays. In the matter of part-time, or when-actually-employed workers, the law regarding payment for Saturday half-holidays has been definitely outlined in the decision of May 9, 1931: "Employees for whom no regular hours of work are fixed, whose employment is part time or intermittent, and who are paid by the hour for the time actually worked, are not entitled to the benefits of...Saturday half holidays..."

This matter was brought up recently by a station employing neighboring farmers during rush seasons. Sometimes the men worked all week; on other occasions for only a day or two. The point is, however, that even though such workers were employed at times continuously for a week or more, such continuous employment must be considered as incidental and does not entitle them to pay for half holiday--they can be legally paid for the hours they actually work, and no more.

ADMINISTRATIVE NOTES

Outside Publication — A memorandum to heads of offices by Mr. Richey, dated March 12th, says: "An unfortunate incident has just occurred, in which a scientist in the Bureau agreed to prepare a radio talk for an outside agency without prior approval of this office. The talk was scheduled and advertised, and the manuscript therefor submitted for approval just ahead of the time of the broadcast. Because of the nature of the material, and for purely administrative reasons, it was necessary to withhold approval, to the embarrassment of the individual, the Bureau, and the broadcasting agency. This is brought to your attention, in order to promote certainty of obtaining prior administrative approval by employees of the Bureau of acceptance for a broadcast or other program appearance or presentation, in accordance with existing Bureau regulations."

All papers, radio talks, etc. treating in any way of the work or policies of the Bureau or Department must be approved before actually offered outside. There is no objection to a preliminary discussion with publishers. In fact, in asking for approval for outside publication, etc. we prefer to know where and how the material is to be used, compensation to be received, etc. Manuscripts should be headed, for purpose of identification and credit: UNITED STATES DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry. Title_____ By John Doe, assistant horticulturist, Division of Fruit and Vegetable Crops and Diseases. It has recently been decided that Mr. Gilbert's office should keep a file, attached to approval notices, of all such manuscripts, showing editorial changes, so in future it will be necessary to submit an original and two carbon copies of all such manuscripts. The original will be returned to you with official approval, showing editorial changes, if any; one carbon will go to the Office of Information; and the second carbon will be filed with Mr. Gilbert. And be sure to get the manuscripts to us in time for adequate consideration. They go first to Dr. Auchter for his preliminary approval, to Mr. Gilbert for editorial and subject matter review, and then to the Chief of Bureau for approval. When such manuscripts are received at practically the last minute before the date of a meeting, say, it is impossible to give them proper attention and in order to secure approval in time it is necessary to stop other important work and devote immediate attention to them, a proceeding manifestly unfair to others who have manuscripts being considered editorially. Telegraphed approvals are undesirable as it is not practicable to indicate clearly changes that may have been necessary in the manuscript.

Where photographs are to be used, remember that it is the general policy of the Bureau to use only those that have been published, though it is proper, of course, on occasions to furnish previously unpublished photographs for use in special articles primarily presenting the results of some phase of our work. All photographs must be submitted to the Chief of Bureau for approval, of course.

Vol. 8 No. 3 April 15, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., May 1, 1936 No. 9

Experience vs.capital

A man discussing his friend's new business venture was a little surprised to learn of the financial arrangements.

"So your partner is putting in all the capital?" he commented. "Oh, that's fair enough," explained the friend. "He's supplying the capital and I will supply the experience. And it will be all square in a year or so for I shall have the capital and he will have the experience."

It is a little surprising to find that some of our workers appear to prefer experience to capital. At least we have warned them repeatedly that they must purchase certain items from the Federal Prison industries--yet they continue to buy such items in the field, making it practically certain that they will have to pay for them personally--thus acquiring experience at the expense of captial. The Comptroller General has definitely ruled that we MUST buy such items as deck mats, brushes (all kinds--including paint, varnish and floor), canvas, cloth bags, burlap bags, brooms, tentage, all gray iron castings, bronze castings, and aluminum castings from Federal penitentiaries. The ruling says, in part:

> ".....There is no authority for allowing credit in the accounts of disbursing officers for payments made for articles purchased commercially of the classes manufactured by the Federal penitentiaries, unless there be a showing that the Federal penitentiaries were unable to furnish such articles, and alleged emergencies constitute no authority for failure to comply with the provisions of said statutes, the terms of which are mandatory."

You'd be surprised how difficult it is to prove that the Federal penitentiaries were unable to furnish these items. Orders for these things MUST be placed through the Washington office--unless, as stated, you wish to exchange capital for experience by paying for them yourself.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"Additional observations made during the week indicate more clearly that some buds in all varieties escaped the freeze of April 1 and 2," he writes for the week ending April 18. "The young apples are beginning to develop and the question now uppermost in the minds of the growers is whether the fruit from these late developing buds will develop normally or whether it will drop in the near future. The apple leaves are now showing the effects of the freeze and those which were beginning to expand on April 1 and 2 are now folded, crinkled or otherwise badly distorted. I anticipate rather serious injury to these distorted leaves from lime sulphur sprays, as the epidermis is ruptured or seriously weakened in many instances. The lime sulphur will probably have ready access to the inner tissue through these weakened areas and the final effect will be similar to spraying leaves badly infected by the scab fungus with lime sulphur. The leaves which have developed since the freeze of course are normal in appearance and should not be injured unduly by the sprays."

He had written April 4: "The outstanding item of this week is the sudden return of winter weather. Under the influence of a strong wind from the northwest the temperature began to drop rapidly during the afternoon of April 1 and reached 21°F. during the night. The next morning the blossoms and leaves in our Ben Davis experimental plots were frozen stiff. April 2, night, the temperature dropped to 19°F."

On April 11 he reported: "The injury is closely correlated with the state of development of the buds and throughout the district the Ben Davis trees have probably suffered most as their buds were more advanced at the time of the drop in temperature. Varieties such as Grimes, King David, Winesap and Stayman Winesap in most cases have escaped to varying degrees and give promise of a portion of a crop at least. Ingram and Rome Beauty, two varieties very late in developing but not planted extensively, escaped injury almost completely. The varieties Delicious and Jonathan are midway between the Ben Davis and the Grimes, King David, Winesap, Stayman group in the amount of injury. Some Jonathan orchards show heavy distruction of the blossoms, while others show only a small percentage of the total number of blossoms killed."

W. W. Aldrich, Medford, Oreg.

"I spent a day and a half dabbling with tree injection with solutions to determine whether increasing the water, sugar or nitrogen content of limbs might increase the set of Anjou fruit," he writes April 13. "I was surprised to observe that a limb 4-cm. in diameter would take up 2 liters of solution within 24 hours. This observation led to the use of 5-gallon carbuoys for injecting water at the bottom of scaffold limbs 10-15 cm. in diameter. With such limbs 5 gallons of water was taken up within 36 hours. When 5 gallons was again made available through the same hole in the limb, water intake was not quite as rapid."

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg. (continued)

Writing from the U. S. Pear Field Station on March 30, he says: "The night of March 29-30 brought a sudden period of low temperature which may have caused considerable injury to Howell, Bartlett and Anjou blossoms, which are in the white stage just prior to full bloom.

"The low temperature came as a cold wind out of the foothills to the southwest and northwest, rather than as the windless low temperature resulting from excessive heat radiation on a clear, cool night. Beginning about 9 p.m., air temperatures dropped very suddenly from 33° to 27° in all parts of the Valley between Phoenix and Central Point. In many fully-manned heating operations the temperature had dropped to 26° before the necessary number of heaters could be lighted.

"At the Medford Experiment Station heaters were lighted at 9:45 p.m. and within three-quarters of an hour there was nearly one heater for each tree being fired. For several hours temperatures were maintained above 30°, which was the minimum for the Bartlett and Anjou just prior to full bloom. From 11:00 to 1:30 a.m. a slightly overcast sky in the Table Rock district made only moderate heating necessary in the Tuttle, Redskin and Modoc orchards. By 1:30 a.m., however, the sky became perfectly clear and the southwest or northwest wind reduced the air temperature in all unheated orchards to at least 22°. The Suncrest orchard, located high on the east side, reported 19°. The coldest weather station maintained by R. J. Rogers and myself was in the Carkin orchard, which showed 23° at 1:30 and 20° at daybreak.

"The desirability of maintaining Anjou and Bartlett blocks at temperatures above 30° in spite of the wind, made the heating the most difficult in the history of the Valley. In many orchards the firing of all heaters did not raise the temperature above 26° after 2:00 a.m. At the Medford Experiment Station the firing of 1-1/2 heaters per tree raised the air temperature only to 27-1/2° on the windward side of Block 1. Since with these windy conditions our 2-1/2 gallon heaters burned dry in two hours and since firing was started at 9:45 p.m. it was necessary to refill heaters during the night, beginning at 2:30 a.m. With three men refilling heaters, the oil was burned faster than it could be replaced. Since the temperatures remained between 27° and 28° in spite of heavy firing, all heaters in the orchard, even where two heaters were together, were lighted at 4:00 a.m.

"In an effort to raise temperatures in Block 1 containing experimental plots refilling of heaters in blocks 3 and 4 was abandoned. By 6:30 a.m. all heaters in Block 1 had been refilled once and border rows

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich (continued)

had been refilled twice. With the expectation that heating would be easier after sunrise, refilling of Block 1 was stopped at 6:30 and heaters in Block 4 (most of which had gone out about 5 a.m.) were refilled and again lighted. However, air temperatures did not increase after sunrise and by 7:00 a.m. all heaters in Block 1 had burned out and air temperatures had dropped from 28 to 26°. Full firing of all heaters in Block 4 until 8:30 a.m. barely maintained temperatures in that block at 28°. The tremendous amount of oil smoke kept the sun obscured the entire morning and it was 10:00 a.m. before air temperatures increased to 31°.

"In orchards equipped to refill heaters the experience was similar to that at the Medford Experiment Station. In other orchards one of two procedures was followed:

(1) Heaters were fired at full blast until oil was exhausted.
(2) Heaters were fired at moderate blast until about 6:00 a.m.

"The surprising result of this 9-hour period of low temperature is that very few Anjou or Bartlett blossoms show browning of pistils or ovules. However, it seems very odd that temperatures between 22° and 26° at this stage of blossom opening did not cause a greater amount of visible injury. While I do not believe that the unavoidable low temperatures at the Medford Experiment Station have seriously affected our prospective crop, I fear that there may be sufficient injury to interfere with the normal amount of fruit set resulting from the various pruning, fertilization and soil moisture treatments.

Milo N. Wood, Sacramento, Calif. April 4, 1936.

"A field trip was taken to the Paso Robles district for the purpose of studying the almond situation there. This district has been troubled with too much rainy weather during blooming time and the early drop was very heavy.

"In some instances where a reasonable set was to be expected, frost caused a heavy loss. It seems very probable that there will be less than 1,000 tons of nuts produced in the whole district this year. Observations of other orchards in the Sacramento Valley and parts of the San Joaquin Valley show also that the crop will be very light. In nearly every almond-growing district it rained during the entire blooming season. The very early varieties have set a rather light crop and the late blooming varieties, such as the Texas, and in some instances the Drake, have set a crop. It is clear that the almond production of the entire State will be very light this year."

DECIDUOUS FRUIT INVESTIGATIONS

Edward C. Hughes, Davis, Calif.

"More detailed reports of the frost damage are now available throughout the State and, as is usually the case, the first reports were rather exaggerated," he reports for the week ending April 11. "The losses are quite variable from section to section, but a conservative Statewide average of damage seems about as follows: Apricots, peaches, and pears 15 percent loss, and prunes 20 percent. Although the average for peaches is 15 percent, the loss in the principal cling sections of the Sacramento Valley probably is higher than this, so the surplus in 1936 will be somewhat reduced. I understand the canners are no longer holding their 1935 carry-over, as was reported immediately after the frost.

"Walnuts were hard hit in the Sacramento Valley but little damage was done in the San Joaquin and Santa Clara Valleys and the southern areas. Thompson Seedless grapes suffered a good deal in the San Joaquin Valley. The most severe injury to fruits in general was in the Sacramento Valley and the county west of there, but no fruit, with the possible exception of oranges in the south, was free from some damage."

He had reported previously on the breeding work. "There were made a total of 10,900 crosses and 5,600 selfings, including both apricots and plums. Unfortunately, there will be very few fruits to harvest, due to frost. The early morning of March 25 saw the temperature down to 28°F. in most of this region. This was low enough to kill most of the crosses made. As in previous years, the bagged branches were hit worse than those from which the bags had been removed, and it so happened that most of our crosses were still under bags." As indicated above, the first reports of damage from frost proved to be somewhat exaggerated.

H. F. Bergman, Amherst, Mass.

"The winter flood has been taken off most of the bogs but there are some on which it will be held until about May 20," he writes April 18. "The vines appear to be in better condition than they were just after the winter flood was withdrawn in the two years preceding.

"Blueberries came through the winter in much better condition than they did last year or the year before that. There is hardly any winter killing evident--only the extreme tips of some twigs which probably had not fully matured last fall. The flower-cluster buds are abundant and well advanced. Some additional crown gall infections have shown up."

VEGETABLE INVESTIGATIONS

H. L. Blood, Logan, Utah

"We are just shaking off an unusually heavy blanket of snow which fell March 31st," he writes on April 3. "While our winter has been comparatively mild with an abundance of moisture, its death struggle is very hard. True to the old adage, March in the Rocky Mountains came in like a lamb, for we were having beautiful weather, and went out like a lion with a heavy snowfall and a blizzard that blocked all mountain passes as completely and as effectively as they had ever been blocked during the winter.

"In Northern Utah the recent snow cover has repulsed the onset of spring. The snow coverage in the mountains, already well above the average, was greatly increased. The irrigation needs of the major portion of the intermountain country will be more adequately taken care of in 1936 than they have been for a great many years. Should a sufficiently high temperature wave strike the intermountain region to melt the snows piled in the mountains rapidly, considerable damage from floods may be experienced. The below normal late winter and early spring temperatures and the unseasonal snowfall have resulted in no particular damage at this writing except to delay the usual spring activities. Peas, sugar beets and much of the spring grain will be planted later than usual. An abundance of available moisture will assure rapid growth, however, when plantings are finally made.

"The mild daily temperature and the comparatively cold nights of the past month have been too low to stimulate fruit tree development and consequently no damage will result to the fruit crop from the recent storms. The truck garden farmers who have made plantings of all the hardy vegetables stand to suffer the greatest damage. The low temperatures and present heavy blanket of snow favor seed decay and damping off and considerable damage may result unless temperatures rise more rapidly than it appears they will at present....

"The spinach planted last October for overwintering and early spring development of the leaf hopper (Eutettex tenellus) population on our curly-top resistance trial rounds at Hurricane is growing rapidly. The hoppers are very abundant and an adequate supply of feeding breeding plant material promises to provide us with a liberal early supply of insects on the grounds. Little is known at present of the extent to which the insects passed the winter and their prevalence on the surrounding desert.

"Tomato seed beds for canker, curly top and wilt studies have been planted at Odgen and at Farmington, Utah, but we were caught in the last storm with the plantings at Logan, and they have not been completed at this writing. It appears evident that a late spring will delay the possibility of field plantings until after June first, consequently the delay in seed bed planting will not be serious."

NUT INVESTIGATIONS

Filberts "Both filberts and filbert x hazel hybrids at Beltsville and Arlington Farm appear to have fared unusually well during the past winter, despite the severe weather which extended from mid-November to early March, thanks to the relative freedom from sudden changes and the almost complete absence of warm spells at critical periods," writes C. A. Reed from the U. S. Horticultural Field Station, Beltsville, Md.

"Staminate mortality ranged from an apparent zero to 100 percent, depending largely upon the hardiness and physical soundness of the variety or individual hybrid plant, as well as local environment, particularly with reference to elevation. Injury was greatest at the lowest level at Beltsville. Air drainage at Arlington Farm being good, there was relatively little damage at that place where there are European varieties only and where in the past destruction has been complete or nearly so during much of the time. Taking the trees as a whole, on April 1st the outlook for a good crop is highly satisfactory at both places.

"Winter killing of the catkins took various forms. In many cases all would be killed on an entire tree; in others only those on certain branches were found dead. The ones on branches which have been weakened by mechanical injury or by drouth were invariably destroyed. Again all or only part of the catkins would be killed at the tips or for part of their length. Sometimes catkins which appeared entirely dead early in the season would open up later and shed considerable pollen, which under the microscope appeared partially or entirely sound. Close examination of pollen from many apparently killed catkins in some cases showed complete transparency, but in a great majority of cases the nuclei looked normal. It was only in rare cases that all of the pollen grains from even the most severely injured catkins were transparent.

"Catkins which have been severly injured were late in opening and releasing pollen. From field observations alone it was practically impossible to distinguish between injured and uninjured catkins until the flowers came into bloom.

"The prolonged low temperature which continued into March almost entirely restrained even the earliest varieties from pushing their buds of either sex into bloom. The warm weather of the latter half of March caused both staminate and pistillate flowers to come suddenly into bloom and to have an extremely short period of what could be called the height of the season. Practically all varieties, including European and American, and their hybrids suddenly burst into full bloom on the 14th of March and shed the greater part of their pollen by the end of the third day. However, considerable pollen in small quantities continued to be discharged for about two weeks.

NUT INVESTIGATIONS

C. A. Reed, Beltsville, Md. (continued)

"Schuster has reported that the normal blooming period in Oregon with European varieties of all kinds extends over a period of from 10 to 12 weeks. Taking into account the usual behavior of the Barcelona variety, which in the District of Columbia is often found to shed pollen during the first balmy days of December and now and then to have a few pistillate flowers open at the same time, the total range in this locality is from then until April 5th when the last of the American hazels are usually through, or from 14 to 16 weeks.

"Considerable cross-pollination with further breeding and the development of an F_2 generation had been planned, but with the flowers all kinds bursting out at once this became impossible.

"The filbert blossoming period in the general neighborhood of the District of Columbia is ordinarily about two weeks earlier than that of Lancaster, Pa. This year, however, the periods of the two places coincided almost exactly. A trip was made to Lancaster on March 18 in the hope that it would be possible to make some of the crosses there that had been planned for Beltsville, but the season there was found to be no later than at Washington, D. C. Singularly enough, Barcelona, which as already noted is one of the earliest, was found to be about the latest of any variety in shedding pollen at Lancaster."

C. E. Schuster, Corvallis, Oreg.

Writing for the April 6-11 period he says: "One day was spent in the field checking winter injury on walnuts. In part of the cases the winter injury has been greatly exaggerated. In other cases it was exactly the reverse. One interesting case was where we found considerable damage on the black walnut rootstock. Up to the present we have found almost no evidence of winter injury on black walnuts, but in this one planting where practically all of the trees were killed we found evidence of winter injury or some related injury extending from 2 to 8 inches below the graft union. It seemed to us that the rootstock which was used for that planting was something different from the Northern California black walnut....The weather has reversed itself, changing from cold to warm."

He had reported earlier, April 4, that damage had been reported from many sections as a result of heavy frosts or freezes during that week. "A cherry tree in my back yard may be typical as it shows about 50 percent of the bloom killed," he wrote, "even before the flowers were visible in the bud. The season is late...."

NUT INVESTIGATIONS

B. G. Sitton, Shreveport, La.

"On Friday morning, April 3, a minimum temperature of 35°F. was recorded by the weather bureau. Much lower minimum occurred in the river valley where considerable ice formation was observed...In the J. H. Fullilove orchard near here, there was considerable injury to new growth of pecans. This injury seemed to be confined to low-lying ground away from bayous or streams. On the very lowest land the Pabst, Success, Moneymaker, and Carmen varieties were very severely injured, practically every shoot on the trees was completely killed up to a height of approximately 8 to 10 feet from the ground. No other varieties were in close proximity to them. On higher ground there were other varieties, but none of them were injured as badly as those on this low ground. In the higher location the Schley was injured more than other varieties observed, with Pabst intermediate and Stuart only slightly injured. No injury was observed to Centennial or Nelson, the earliest foliating varieties, but these stand in more or less protected locations. Peach trees on high land in close proximity to injured pecan trees showed no sign of injury. This is the first case of late spring injury to pecans that has come to my attention. It is usually stated that pecans do not start growth until all cold weather is past.

"A record low for this station of 30°F. occurred April 3, accompanied by ice and a heavy frost which did considerable damage," he reports for the Robson, La. station. "A survey of the damage done on the station shows that the Schley variety of pecan was the hardest hit. The Nelson has developed even further than the Schley, but was less injured. Other varieties which are developed about equal to the Schley were either not injured or injured only slightly; indicating that the Schley must be more easily injured by frost than other varieties. The varieties which were injured only slightly are: Moneymaker, Frotcher, Pabst, and Nelson. Injury was greatest near the ground. Walnuts, lespedeza and the newly planted tree of the Brake pecan were severely injured by the frost. Figs and Kudzu were slightly injured. The newly planted chestnuts show only occasional signs of frost injury."

Writing April 11th he says "During the week further reports have been received of the injury to pecan trees by the cold weather which occurred on April 3rd. Apparently this injury was rather extensive, occurring in most of the orchards on low lands. A visit was made to the Bollinger orchard near Shreveport. Small trees on higher ground in this orchard were slightly injured and older trees further down the slope were badly injured, while the old trees in the flat low land in the lowest part of the orchard were not injured because they had not started growth.

NUT INVESTIGATIONS

B. G. Sitton (continued)

"It was not possible to estimate the susceptibility of the different varieties to the cold in this orchard because of the difference in the degree of foliation on the various trees, but it was observed that the Schley had practically all of its new growth killed, whereas some other varieties would have new growth killed on one terminal and the terminal adjoining it would be uninjured."

Reporting on work at the Robson, La. station, he stated: "The average green weight per acre for all plots cut to date are: 24,957 pounds of the mixture of Austrian Winter Peas and Hungarian Vetch on the winter legume plots and 10,385 pounds of rye on the winter non-legume plots. In cutting these cover crops 10 samples were taken on each plot with individual samples on a single plot frequently varying in weight from 18,000 to 35,000 pounds average per acre when the mean weight per acre for that plot, based on the 10 samples, was 24,550 lbs."

C. L. Smith, Austin, Tex.

"Examinations of pecan trees for freeze damage were made at several places between Austin and Arlington," he writes April 11. "The damage was tremendous from Temple northward in most locations. In many cases the wood is injured severely on 2- to 3-year-old growth. Reports from Oklahoma growers indicate very severe damage there. Thus it is impossible for the western pecan territory to produce more than a small crop this year. Drouth conditions are becoming severe, and field crops, pastures and all are being badly affected. Reports indicate heavy loss of fruit crops from the freeze in East Texas."

Paul W. Miller, Corvallis, Oreg.

"During the latter part of the week Mr. Schuster and I made a survey of the amount of damage occasioned by the freeze of October 1935 to walnut orchards in the vicinity of Gaston and Forest Grove, respectively," he writes April 11. "All variations in the degree and amount of injury were found, from little or no damage to severe injury. As in other localities in the Willamette valley, young orchards up to 6 years of age sustained the greatest amount of damage. There was one 3-year-old Franquet planting visited, located northeast of Gaston, in which every tree examined was dead. The man who cared for the orchard stated that practically every tree in the whole planting was similarly affected. The peculiar feature about the damage in this orchard was that the black walnut rootstock was also affected to a greater or less extent. This constitutes the first case of injury to the black walnut roots I have noted. The roots were under-sized and had not made the growth that the Northern California black walnut typically makes, which leads me to believe that these rootstocks are not pure Northern California black walnuts but hybrids or some other species of black walnut."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"The value of irrigation during dry periods is strikingly brought out by the present stand and growth of two rows of pecan seedlings planted in the fall of 1934, one of which was well irrigated during the summer of 1935, while the other received but little water," he notes in his report for the week ending April 11. "The stand of trees in the heavily irrigated row is as perfect as could be desired and the growth is strong and uniform, while the stand and growth in the poorly irrigated row is very poor. It is estimated that there are at least three times as many trees in the heavily irrigated row as there are in the poorly irrigated row. These rows are approximately 650 feet long and about 7 feet apart.

"An examination of the pecan trees at Philema and in one or two other orchards discloses abundant evidence of a heavy pistillate bloom this year. Many trees are still not far enough developed to show pistillate flowers but they have been found in abundance on two old seedling trees, and on Schley, Moore, Moneymaker, and Alley trees. They are just sufficiently developed at this time to be visible without spreading the surrounding small leaves. Catkins more than half mature have yet to be seen. Moore trees in the McCord orchard which produced the heaviest crops in 1935 are devoid of both catkins and pistillate flowers, while others which bore no nuts or smaller crops are producing both types of flowers.

"I have never seen Tung trees blossoming as heavily as they are doing this year. It is seldom that a tree is seen that is not white with flowers."

ADMINISTRATIVE NOTES

Speeches Bureau of Plant Industry Memorandum 883, dated April 21, 1936, quotes a memorandum of April 20, 1936, from Mr. C. E. Gapen, Chief, Press Service:

> "When we issue a press release based on an address it is desirable that the hour as well as the date of the speech be given when the article or the speech is sent to us.
>
> "This information is necessary in order that we may be sure of the proper release date to be put on the story."

In submitting papers for approval by the Chief of Bureau, the information desired by Mr. Gapen should be furnished.

ADMINISTRATIVE NOTES

Bids All 1034 vouchers covering materials purchased under bid for payment under letter of authorization should carry the bid number and acceptance date. If there is a discount for payment within a specified time, this also should be indicated on the voucher. It is particularly important that this information be furnished on vouchers amounting to less than $50.00, since usually only purchases of over $50.00 are covered by bids and it would unduly delay all vouchers to check every one with existing bids.

Fertilizer The Tennessee Valley Authority can supply governmental agencies triple superphosphate fertilizer from the production of its experimental plant, approximately 43% P_2O_5, at 70 cents per unit f.o.b. cars in bags at Sheffield, Alabama. This would be about $30.00 a ton f.o.b. cars.

The Tennessee Valley Authority desires that agencies using this material seek the cooperation of the county agricultural agent or other representative of the State extension service so that it may be advised at some convenient date of the results obtained from the use of the fertilizer. It is understood that this fertilizer, so furnished, is to be used on Federally owned land and is not for resale, directly or indirectly.

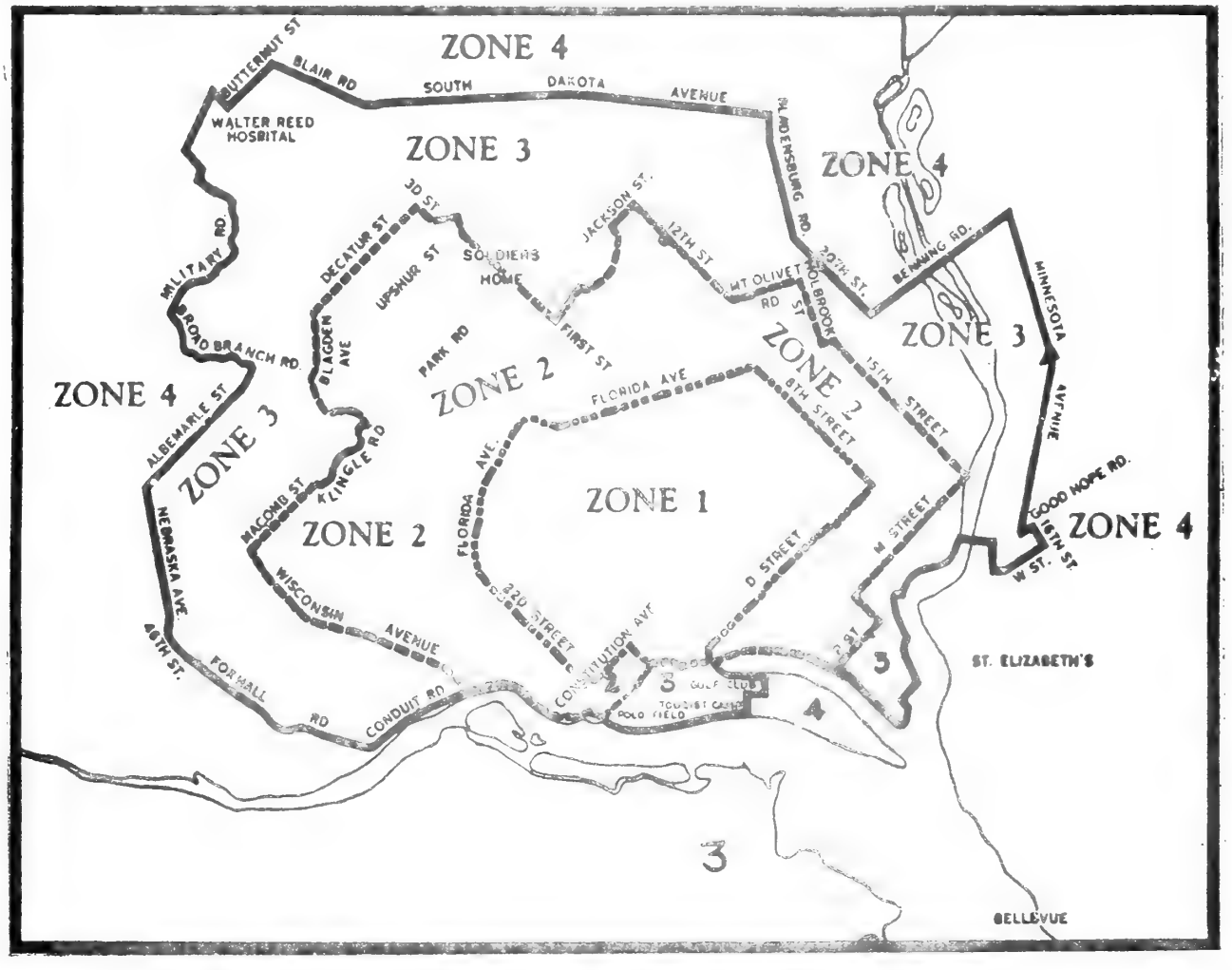
Old papers and records Under the National Archives Act, the Archivist, in cooperation with the Works Progress Administration, has now completed plans for a nation-wide survey of archives and records stored in offices in the field, in general the unpublished records of any agency of the Federal Government made in connection with the performance of its functions. Section 3 of the Act provides:

> "All archives or records belonging to the Government of the United States (legislative, executive, judicial, and other) shall be under the charge and superintendence of the Archivist to this extent: He shall have full power to inspect personally or by deputy the records of any agency of the United States Government whatsoever and wheresoever located, and shall have the full cooperation of any and all persons in charge of such records in such inspections, and to requisition for transfer to the National Archives Establishment such archives, or records as the National Archives Council, hereafter provided shall approve for such transfer."

It is clear from this that archives and records of the Department, wherever located, even though regarded as useless by the Department, should not be destroyed prior to a proper inspection by deputies of the Archivist and until it is clear that they are not such as the National Archives Council determine to have permanent value or historical interest. In other words---Hold Everything!

ADMINISTRATIVE NOTES

Taxicabs The General Accounting Office is now holding travelers to the official taxicab rates according to the zone system in Washington, D.C. and the maximum allowable between the Department of Agriculture and Union Station is 20c unless there are more than two pieces of hand baggage in which case 10c extra is allowed if the number of pieces is shown. Points between whichtravel is performed must be shown, of course.



Zone Rates.--A trip confined to one zone, 20c; from Zones 1 to 2 and vice versa, 30; Zone 1 to Zone 3, 50c; Zone 1 to 4, 70 cents. A trip from Zone 2 to another point in Zone 2 and crossing Zone 1 is 30c; Except in the case of Zone 2 as stated, a trip between two points in the same zone and necessarily passing through a difference zone is 40 cents. A trip not entering or passing through Zone 1 is 20 cents for each zone.

Personal service charge, 25c; each trunk, 50c; hand baggage in excess of 2 pieces, 10c each piece; waiting time, 10c each 5 minutes; passengers in excess of 2, 10c each per trip; each stop over 5 blocks off direct route, 20c; each stop on direct route, 10c.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S_E_M_I - M_O_N_T_H_L_Y N_E_W_S L_E_T_T_E_R_.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

Vol. VIII Washington, D. C., May 15, 1936 No.10

Warming up the Ice! Once upon a time there was a physicist who after long effort devised equipment that would cool the whole atmosphere of his entire home--and then he discovered he could obtain the same results merely by coming home late for dinner. All refrigerating problems are not as simple as that, of course. It is a little startling, however, to learn that the specialists in our section of handling, transporting and storage investigations have found it desirable to warm up ice in order to cool vegetables in transit efficiently!

"Failure to let ice of low temperature 'warm up' before using it to cover shipments of vegetables may freeze some of them in transit," says the Department's press release on the subject. "Considerable head lettuce and carrots were found damaged in transit during the warm months last year by crushed ice--generally used now in top-icing lettuce and carrots. The ice is crushed in the packing house and immediately blown over the load without much loss in temperature. Chunk top-ice, when used, is placed over the vegetables as they are loaded in the car and has a better chance to warm up to a temperature which does not cause freezing injury.

"Freezing damage can be prevented easily by allowing the ice to 'warm up' before it is crushed. If there is any doubt about temperature the ice should be allowed to stand until it begins to melt. Two blocks of ice may look alike, but one may be much colder, if from a colder storage room. Ice melts at 32° F. Below this its temperature follows closely that of the surrounding air."

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASE INVESTIGATIONS

W. T. Pentzer, Fresno, Calif.

"Our time has been spent the past few weeks in continuing the precooling studies with asparagus which were begun in 1933," he writes under date of April 27.

"At the request of shippers and precooling agencies, temperature records were obtained during the precooling of asparagus in refrigerator cars with inside fan units and truck-mounted mechanical refrigeration units. It was interesting to observe the changes that had taken place since 1933 when precooling became generally adopted by the shippers. Then the precooling period with portable fans mounted inside the car was 5 to 10 hours and often the ice in the bunkers was not replenished during the precooling period. Now the fans are operated until train time and a precooling period of 16 to 20 hours is not uncommon. The ice in the bunkers is replenished several times during the precooling period. The result of the longer cooling is a change in shipping methods. In 1933 shipments under initial ice only were confined to the early part of the season, but this season many cars moved under this tariff as late as April and then the change was usually to one re-icing in transit instead of to standard refrigeration with 10 or 12 re-icings.

"With high field temperatures appearing the second week in April, asparagus began to grow very fast after a prolonged cold period during which growth had been checked. Until the canneries were opened, to which the production could be diverted, the shippers of fresh asparagus were just about snowed under. The Filipino cutters were even cutting by flash-light starting their day at 1:00 a.m., trying to keep ahead of the fast-growing crop."

Edwin Smith, Wenatchee, Wash.

"Mr. A. C. Adams of the Bank for Cooperatives (Farm Credit Administration) and assistants, have been conducting a series of grower meetings in the interests of organized and cooperative marketing," he writes April 29. "Their general plan is for the growth and coordination of the various northwestern cooperative groups such as the Wenoka, Skookum, Yakima Fruit Growers and Hood River Apple Growers associations. They would also have other groups added to this list. The Yakima and Wenatchee Traffic Associations are also endeavoring to effect an organization of all interests for the industrial advertising of apples....The weather has continued warm and cherries, pears, and apples have been forced into bloom at the same time. Apples are now in full bloom in Wenatchee, whereas the calyx spray is in order at Rock Island. Generally speaking, the bloom is good for all fruits, although winter injury will cause a reduction in the apricot crop."

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASE INVESTIGATIONS

Cooperative Investigations: The precooling and shipping of California asparagus is discussed in Bulletin No. 600, University of California, College of Agriculture, Agricultural Experiment Station. The title is "Precooling and Shipping California Asparagus," and the authors are W. T. Pentzer, R. L. Perry, G. C. Hanna, J. S. Wiant, and C. E. Asbury.

The work reported on is an excellent illustration of the effective manner in which we are cooperating with State experiment stations and others vitally concerned in matters falling within the range of our investigations. Precooling of California asparagus before shipment to eastern markets has become an established commercial practice because it secures a reduction in transit refrigeration costs and if well done assures a satisfactory condition on arrival. Any investigation tending to make sure that it is well done thus benefits grower, handler, and consumer.

"The asparagus growers of California rely upon two outlets for their production; the cannery and fresh shipment to eastern and local markets," says the authors in their introduction. "During the five-year period 1929 to 1933, according to estimates of the Federal-State Market News Service, the average annual acreage for canneries amounted to 44,380 acres; for fresh shipment 20,770 acres. Carload shipments of fresh asparagus for this period totalled 11,480 cars, an average per year of 2,296 carloads.

"The shipments of fresh asparagus represent a large investment, not only in the asparagus itself but likewise in costs of harvesting, grading, packing, loading, freight, and refrigeration by the time it reaches the East. Failure of the asparagus to arrive on the market in good salable condition would therefore entail serious losses to the industry and jeopardize an important outlet for almost one-third of the production.

"A condition approaching this existed in 1930, 1931 and 1932, when serious losses were experienced in many shipments as a result of mold growth on the asparagus in transit. Since no experimental evidence was available to establish the cause for the excessive mold growth the University of California was requested by representatives of the asparagus industry to investigate the handling and shipping of asparagus. These investigations were conducted cooperatively by the University of California and the United States Department of Agriculture."

It is rather odd that whereas precooling of some fruits has been an established practice for many years, few vegetable shipments from California, until recently, have been precooled. Yet many vegetables, such as lettuce, peas, asparagus and celery, are fully as perishable as fruits that are commonly cooled and are greatly benefited by the removal of "field" heat as soon as possible after harvesting.

VEGETABLE INVESTIGATIONS

W. D. Moore, Charleston, S. C.

"On April 19 and 20 we had a slight frost which damaged such crops as cucumbers and cantaloup to a slight extent all the way to the coast. Some slight damage has been reported on tomato fields in Beaufort county as a result of severe weather that we experienced at the beginning of April. The potato crop is growing off very rapidly at this time (May 1) but is marked by uneven stands and late germination in many cases. It is hardly possible that a normal crop can be harvested during the present season due to this condition. However, the farmers are very optimistic over the economic outlook at present and the season with regard to this crop may close entirely in favor of the average grower. Considerable damage has appeared in practically all fields from Rhizoctonia infection in spite of the fact that practically all potato seed was treated prior to planting. No foliage diseases of consequence have appeared to date.

"In spite of the fact that our local growers lost practically their entire investment in winter cabbage, they have small chance of recouping these losses on the spring crop. To date a large percentage of the fields are showing from 5 to 20 percent seed stalks as a result of the cold since setting in the field in January....The bean crop is late throughout the whole trucking area due to poor stands from the heavy rains in March together with terrific frost damage on March 24. In addition, considerable bacterial blight has developed in all fields. The normal harvest season for beans begins in this area about May 15, but it is hardly possible that any appreciable tonnage will be picked this year before May 25.

"Green peas are now being harvested throughout the pea section and it is possible that a full crop will not be realized in view of the damage from cold weather and unfavorable growing seasons during this spring. Powdery mildew has developed on this crop in some instances but no appreciable damage has been observed to date. The tomato crop in both Charleston and Beaufort Counties is in excellent condition at this time and shows promise of developing into the best crop of the year. Diseases have been at a minimum so far...."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"About two weeks ago our spell of cool weather had a sudden break and since that time our daily temperatures have ranged from 75° to 85°F.," he writes April 30. "As a result, all the trees have pushed very rapidly. Many of the growers were caught in the middle of the dormant spray with foliage and fruit buds opening. As a pure estimate I would say that probably half of the trees in the valley this year will not have a dormant spray. If the present temperatures continue, our apples will be in full bloom in about a week. Apricots, peaches and cherries are practically at full bloom now."

FRUIT AND VEGETABLE UTILIZATION INVESTIGATIONS

Blueberries for Freezing

The rather rapid increase in acreage and consequently in total production of the large fruited highbush blueberries introduced to cultivation as the result of many years of selection and hybridization by Dr. F. V. Coville, has awakened the interest of growers in possible methods of extending the distribution and lengthening the season for the fresh fruit, which cannot be held for extended periods in cold storage.

An article entitled "Varietal Suitability of Cultivated Highbush Blueberries for Freezing in Consumer Packages," by H. H. Moon and Joseph S. Caldwell of this Division, and Helen F. Smart, formerly of the Division but now with the Bureau of Chemistry and Soils, in the Fruit Products Journal for April, 1936, Vol. 15, no.8, pp. 229-31, 248, 251, reports results of work undertaken in 1934 in response to a request for assistance from growers.

Fruit of five of the more widely grown varieties--Pioneer, Cabot, Concord, Rubel and Rancocas--was obtained from growers in the vicinity of Pemberton, N. J., transported to the Arlington Farm Experiment Station at Rosslyn, Va. by automobile, packed with a variety of treatments, including various concentrations of sugar sirup, dry sugar, and without either sugar or sirup in one-pint and five-pint paper containers and No. 2 cans, and frozen and stored at 15°F. for approximately 7 months prior to examination.

All the fruit retained the characteristic freshness and bloom of the freshly harvested fruit to a very high degree, but that packed in dry sugar was somewhat less attractive than the sirup packs because some shriveling of the fruit had occurred. Employment of 40, 50 or 60 percent sugar sirup preserved the attractive appearance and characteristic flavor of the fruit in very satisfactory degree; most of the judges preferred the pack in 50 percent sirup to those having either higher or lower sugar content. In quality, the varieties were ranked in the order of excellence as Pioneer, Cabot, Concord, Rubel and Rancocas. The first three ranked very closely together, while Rubel and Rancocas were distinctly lower in quality. This is essentially the ranking given the varieties as fresh fruit, and indicates that all varieties preserve such quality as they have to about equal degree when frozen.

The authors consider that the freezing of the choicer varieties has distinct possibilities as a means of widening markets and increasing the length of season for the cultivated blueberry, but definitely recommend that freezing preservation be restricted to the choicer varieties of high dessert quality and that these be packed only in 50 percent sugar sirup. They consider that mediocre and low-quality varieties should be gradually eliminated from cultivation and that no attempt to divert them from the fresh market into frozen form be made, as such attempt would react injuriously upon demand for the choicer varieties.

DECIDUOUS FRUIT INVESTIGATIONS

Leslie Pierce, Vincennes, Ind.

"Up to this date, April 19, the year 1936 has established some new records in the way of low temperatures and lack of rainfall. January showed a departure from normal in precipitation of -2.39 inches, February -1.01, March -2.71, a deficiency for the first three months of the year amounting to 6.11 inches. The rainfall for the first 19 days of April was 1.69 inches. The temperature for the same period in April shows a daily departure from normal of -9.8 degrees. Freezing temperatures occurred the nights of April 1, 2, 3, 6, 7, 16, 17 and 18.

"The light set of apple blossom buds in this section was further reduced by low temperatures occurring the nights of April 7 and 17. It now seems certain that the Vincennes area will produce not more than 40 percent of a crop of apples this season. Many of the apple flowers that will bloom will not set fruit on account of having had their pistils killed by cold weather which did not injure the petals and anthers.

"The peach trees in our experimental orchard are beginning to put out a few leaves. Elberta and Hale are showing an average of about 50 clusters of leaves per tree. Big Red and South Haven are showing fewer leaves than Elberta and Hale. About 30 percent of the leaf buds on Wilma, Belle of Georgia, Early Elberta and Hiley survived the freeze. Salberta and Brackett show about 50 percent of a normal crop of leaves. Four-year-old Cumberland and Golden Jubilee came through the January freeze with little apparent injury.

"Cherry trees in this section of Indiana were very severely injured by the low temperatures last January. In some plantings the mortality runs as high as 50 percent. The trees entered the dormant period in poor condition on account of having been completely defoliated by a severe outbreak of the cherry leaf-spot disease the previous season. Cherry trees growing within the city limits, which for some unexplained reason are never defoliated by the leaf-spot disease, came through the freeze uninjured and are now showing a full crop of blossoms."

John C. Dundgan, Fayetteville, Ark.

"So far this season fruit diseases are distinguished by their absence, in contrast to their prevalence last year," he reports for the week ending May 2. "An examination of various orchards from Fayetteville to Bentonville, made during the week, failed to show a single scab lesion or black rot lesion on apple leaves, no cherry leaf spot and no peach leaf curl. A light rainstorm on April 25 and a heavy shower during the night of April 1 brought additional moisture and may favor foliage infections from the various fungi as it continues to be cloudy and humid this morning."

FLORICULTURAL AND ORNAMENTAL HORTICULTURAL PLANT INVESTIGATIONS

Frank P. McWhorter, Corvallis, Oreg.

"Of course," said a lecturer, "you all know what the inside of a corpuscle is like--" He was interrupted by the Chairman of the meeting. "Most of us do," said the latter, "but you might explain it for the benefit of those who have never been inside of one."

What I mean is that Frank now knows what a nematode looks like. Yes, they have one--that explains his long silence. "Tragedy stalks the bulb plot," he writes to Dr. Weiss on April 7th. "Our record, once pure as a baby's foot is now soiled. We have a nematode. Location: Narcissus sent in from Long Island for cooperative experiment.*

"These last have been busy weeks. The reason-averting an iris leaf-spot disaster. A trip to southern Oregon last month showed plainly an epidemic marching north. Or rather riding the wind. These epidemics result from weather conditions favoring infection by strains of Iris Heterosporium, the flag leaf-spot fungus and by other species. In the spring of 1935, Millsap and I developed spray combinations that would stick to iris foliage. We got ready for an epidemic which did not occur; now it is occurring. Through State channels we broadcast the news. A meeting of the State inspection service was called, wherein it was agreed that selected material from every infected field would be sent to my office for causal analysis. 'There are several strains or species of Heterosporia found on bulbous iris foliage--the 'Big Het', the 'Little Het' and intergrading forms. The individuality of two forms (they are species) has been proved by the simple procedure of germinating the spores, photographing the nuclei in spores and germ tubes and comparing the number of chromosomes. In one species they are easily counted at a magnification of 2400, the number being four. In others accurate counts are possible only with cytological imagination.

"When we get through with this program we hope to say, 'Mr. Jones, you have the Big Het; it is dangerous. Get out the spray pump.' Or, 'Mr. Smith, you have Heterosporium cladiosporioides, form 9-1/2, it's harmless, don't worry.' (All well and good, but just wait until some Mr. Jones thinks Frank is saying: 'Mr. Jones, you have the Big Head; it is dangerous' etc.!)"

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Our Agent, Dr. Frank A. Haasis, to whom this communication was sent for comment replied: "The bulbs were given vapor heat treatment (Term used by entomologists to describe a thermal treatment employing air saturated with water vapor. F.W.) for sufficient time and temperature to get rid of the nematodes under normal conditions. It is my suggestion that the strain, having survived the treatment, is extremely potent, hence Dr. Mac has inherited a potential hazard which should put narcissus growing on an even basis so far as Babylon and Corvallis are concerned." F.W.

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"More extensive observations of the conditions in the different orchards around Albany confirm the previously reported heavy pistillate blossom," he writes April 18. "Most varieties, the trees of which have not borne for the past two or three years but which are in fairly good condition, show heavy pistillate bloom. Many trees which had a heavy crop last year are showing more bloom than would normally be expected. Some pistillate flowers have been seen on Stuart trees but this variety and many seedling trees are not yet sufficiently far advanced to determine the prospects. Some trees in the old seedling orchards at Philema are showing a fair to heavy bloom. The weather for the week was fairly cool for the most part. The lack of rainfall brought about a rapid fall in the swollen streams and rivers in this part of the State and allowed the farmers to get their cotton and peanuts reseeded, the previous heavy rains and poor quality of seed having made replanting necessary."

C. E. Schuster, Corvallis, Oreg.

"Walnuts are now beginning to come out quite rapidly," he reports April 18. "Incidentally, with this development the differentiation of winter killing is becoming more apparent in some varieties. One variety we noted some time ago as being very satisfactory for our pollination work this summer has within the last three weeks shown a heavy killing and loss that was not apparent some time ago. This week has been unusually warm for this time of year and the warm weather has been accompanied by drying winds. In some areas the blooming of pears, cherries, and prunes has all occurred very nearly at the same time."

Paul W. Miller, Corvallis, Oreg.

"To assist walnut growers in Oregon who plan to spray for the control of blight to time their sprays properly, details of a spray timing service have been perfected," he reports April 25. "Arrangements have been made to broadcast spray bulletins over radio station KOAC at Corvallis during the spraying season, and the country agents will be kept informed by mail so that they can pass the word along to any growers in their respective counties who may be planning to spray for blight control."

B. G. Sitton, Shreveport, La.

"A .48 inch rain fell during the week, the first rain in over 30 days. Soil moisture is very short and crops are suffering. Much of the cotton and corn planted this spring has not yet come up and probably will not come up until we have sufficient rainfall to thoroughly wet the soil."

ADMINISTRATIVE NOTES

Postage due There is a story, probably a vile slander on the noble race of Scotland, to the effect that an Irishman, Englishman and Scotchman were adrift in an open boat after shipwreck. There appeared to be little hope and the Irishman dropped on his knees to pray. In token of respect, the Englishman immediately removed his hat. They heard a loud splash and looking back found the Scotchman overboard. After a struggle they succeeded in dragging him back in the boat, when they learned that he had not fallen overboard, he had jumped. When the Englishman removed his hat, the Scotchman thought he was going to take up a collection. Well, we are not going to take up a collection, but the Post Office is prepared to do just that when you fail to use sufficient stamps on material that requires postage. Postmaster Burke of Washington, D. C., for instance, writes:

"It has been the experience of this office that several of the field offices of government bureaus are not acquainted with the fact that it is necessary that air mail postage be fully prepaid on matter sent by them via air mail. The failure of officials connected with such field stations to prepay fully the postage required necessitates that this office call upon them in every instance to transmit here the deficiency postage. It is noticed that during the recent months there has been an increase in such cases and it has necessitated the utilization of considerable time and labor on the part of employees here in communicating with the parties at fault and in accounting for the deficient postage. I shall appreciate it, therefore, if you will issue such instructions to all field offices under the supervision of your Department as will result in matter sent by them being fully prepaid with the air mail postage in the future."

We hope, too, none of you labor under the impression held by one worker--that a single air mail stamp was sufficient to carry a package of any weight or size. It took us two years to convince him that he was in error on this point.

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

"During the past week we have been engaged in putting up the different lots of seed stock for planting our increase and test plots," he writes April 18. "This material, the greater part of which was kept in our potato storage house, came through the winter in excellent condition with practically no rotting or sprouting. At present the potato market seems to be in the best condition that it has been in for several years. For the past 10 days the price has fluctuated between $2.40 and $3.00 per barrel, with the latter price now prevailing."

ADMINISTRATIVE NOTES

Expense Accounts and Oaths. In the matter of expense account oaths--and we have reference to oaths in connection with witnessing signatures and not those arising in connection with delayed payments, etc.--attention is being called again to the fact that the following employees of the Department qualify for administering oaths:

1. Chief Clerk of the Department (Chief, Division of Operations).
2. Clerks designated by him, under his jurisdiction.
3. Chief Clerk of any bureau or office of the Department.
4. Clerks under their jurisdiction, designated by them.
5. Forest supervisors and acting forest supervisors.
6. Principal Clerks of National Forests.
7. Chiefs of Field Parties.

Incidentally, it has been ruled that "Chief of Field Party" means the head, or person in charge, of a party of employees engaged in field work of a more or less ambulatory nature in out-of-the-way places. It does not include the head of a field station or office whose headquarters are fixed at a particular place--unless he happens to act as the head of one of these ambulatory parties.

Outside of the Department the following administer oaths:

1. Postmasters and Assistant Postmasters (not deputies).
2. Collectors of Customs.
3. Collectors of Internal Revenue
4. Chief Clerks of other departments, bureaus or agencies.
5. Superintendents, Acting Superintendents, Custodians and Principal Clerks of National parks and other Government Reservations.
6. Superintendents, and Acting Superintendents, and Principal Clerks of Indian superintendencies or Indian agencies.

Chief clerks of bureaus are authorized to designate, for the purpose of administering oaths to expense accounts, clerks in Washington under their jurisdiction and responsible, but they are not authorized to designate clerks outside of Washington.

No charge shall be made by any of the officers or employees mentioned for administering oaths to expense accounts for any employee of the United States. If for his own convenience an officer on employee uses other means of verification than the gratuitous services provided by the statute, any question of payment of fee or charge for an oath thus administered must lie between him and the officer administering the oath.

TEMPORARY REGULATIONS GOVERNING ANNUAL AND SICK LEAVE

These apply to all civilian officers and employees of the Department except the following, who are not entitled to leave: (1) Employees engaged on construction work at hourly rates; (2) persons employed under letters of authorization; (3) employees rendering part-time or intermittent service; and (4) employees serving less than a month of continuous service.

ANNUAL LEAVE

Legal Status of Annual Leave.--While annual leave is a legal right, it should in no case be granted to the detriment or embarrassment of the service. The convenience of the employees must be subordinated to the public interest as to the time and duration of the leave.

Annual Leave Revocable.--An employee on annual leave may be required to return to duty at any time without expense to the Department should the exigencies of the service require such action.

Annual Leave Allowable.--Permanent employees as herein defined shall, unless otherwise specifically provided, be granted not more than 26 days annual leave with pay in each calendar year, and in addition, annual leave not taken in any preceding calendar year from and including the calendar year 1933, not exceeding 60 days. In computing annual leave, Sundays and holidays are excluded. Temporary employees as herein defined shall be granted 2-1/2 days annual leave for each month of service since January 1, 1936. Leave will not be granted for periods of service of less than a month nor for fractional parts of a month. A month of service shall be construed to be continuous service over a period of 30 calendar days. Emergency employees as herein defined shall be granted annual leave in accordance with the regulations governing leave for permanent employees.

New employees.--New employees serving under probationary appointment shall be credited annual leave at the rate of 2-1/6 days per month during the probationary period. After the completion of the probationary period, such employees shall be granted full leave privileges as provided herein. Employees transferred from other departments or from one bureau or office to another within the Department shall be credited with any unused portion of leave accrued in the other department or bureau upon certification by the department or bureau from which the transfer is made.

Annual Leave Which May Be Granted on Separation from the Service.--On separation from the Department by resignation or other termination of appointment without prejudice, except in the case of transfer or retirement, employees shall be granted all accrued annual leave, provided that such leave is applied for and taken prior to the effective date of the separation. Employees about to retire under the Act of May 22, 1920, as amended, may be granted before retirement all annual leave both for the year current and that accumulated from prior years, which could have been allowed them had they remained in the service. Whether accrued leave shall be granted to employees dismissed from the service for cause is a matter to be determined by the Secretary, according to the circumstances of each case. If, at any time an employee applies for annual leave, it is known that he contemplates resigning, or if it is known or contemplated that he will be separated from the service during the calendar year, the amount of annual leave granted should be restricted to accrued leave.

Pro Rata Deduction on Account of Leave Without Pay.--Proportionate deductions from unused annual leave shall be made at the rate of one day for each 14 days or multiples thereof for furlough or leave without pay.

Saturdays.--Annual leave granted for Saturdays will be charged as 4 hours.

SICK LEAVE

Permanent and Emergency Employees.--All permanent and emergency employees, wherever stationed, except employees stationed outside the continental United States and covered by special legislation, shall be entitled to 1-1/4 days of sick leave per month, cumulative with pay, the total accumulation not to exceed 90 days. Chiefs of Bureaus and other officials delegated by them may advance 30 days sick leave with pay beyond accrued sick leave in cases of serious disability or ailments and when required by the exigencies of the situation.

Temporary Employees.--Temporary employees, except those employees engaged on construction work at hourly rates, shall be entitled to 1-1/4 days sick leave for each month of service, leave accruing only after the completion of each month of continuous service.

Sick leave shall conform to the following regulations:

(1) Sick leave with pay may be granted to employees of the Department within the limits now authorized by law, when in meritorious cases such employees are incapacitated for the performance of their duties by sickness or injury.

(2) Accumulated sick leave may be granted at one time or fractionally. The minimum charge for sick leave shall be 1/2 day. The total accumulation of sick leave shall not exceed 90 days. Sick leave in advance of accrued may be granted in one period of 30 days or in periods of lesser amount, but the total sick leave granted in advance of accrual shall at no time exceed 30 days.

(3) Slight illness or indisposition, or absence for the purpose of medical examination, will not be regarded as sufficient reason for the allowance of sick leave. Absence for the purpose of being treated professionally by a dentist or oculist in his office is not allowable as sick leave, but this is not intended to disallow sick leave for detention at home or hospital by illness or disability due to causes as to which a dentist or oculist is qualified to certify.

(4) Saturdays will be charged as whole days in sick leave.

(5) Sundays and holidays will be charged as sick leave when they fall within a period of sick leave, that is, if the Sunday or holiday is one of the days specifically covered by the approved application for sick leave. Pay will not be allowed for Sundays and holidays when immediately intervening between sick leave and a prior or succeeding period in a non-pay status.

(6) Permanent employees transferred from other departments and independent establishments or from one bureau or office to another within the Department shall be credited or charged with sick leave which accrued or was advanced in the other bureau or office upon certification by the bureau or office from which the transfer is made showing the amount of sick leave, accrued and advanced, at the time of transfer.

(7) Notification of absence on account of sickness shall be given as soon as possible on the first day of absence. Application for sick leave must be filed within 3 days after return to duty.

(8) The application for sick leave for periods in excess of 2 days must be supported by the certificate of a registered practicing physician or other practitioner, except that in remote localities where such certificates can not reasonably be obtained the applicant's signed statement as to the sickness and the reasons why a certificate is not furnished may be accepted. For periods of 2 days or less, up to an accumulation of 12 days in any one calendar year, the applicant's signed statement on the required form may be accepted.
(9) Sick leave granted in advance will be charged against sick leave as it accrues. In case of resignation, or termination of appointment, no deduction from salary will be made for sick leave that may have been granted in excess of accrued leave.
(10) Sick leave granted from January 1, to March 14, 1936, in excess of accrued sick leave, will be considered on the same basis as advance sick leave.

GENERAL EXPLANATIONS

Permanent employees are those appointed for permanent or indefinite periods, whether paid by the year, month, day, or hour.

Temporary employees are those formally appointed and who work continuously for a temporary period of a month or more.

Emergency employees are those appointed for the duration of work financed from emergency appropriations.

Part-Time employees are those appointed and required to perform services part of a day where the job or the employment is a full day's service of 7 or 8 hours. Where the job consists regularly of a definite number of hours less than the normal work day, such as charwomen, the employees are considered full time employees and are entitled to leave, the leave day consisting of the same number of hours as the employee regularly works.

Intermittent employees are those appointed and required to perform services at irregular intervals for periods of less than a month.

Authority to Grant Leave.--Authority to grant leave and procedure to be followed in applying for such leave shall be in accordance with the present administrative regulations of the Department.

Employees required to take leave without pay after having exhausted all sick and annual leave shall not be entitled to further leave with pay until there has been a return to duty.

Leave accrues only during each period of temporary employment and may not be carried over to succeeding periods of temporary employment.

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These temporary regulations will remain in force until the issuance of permanent regulations by the President. All questions pertaining to the interpretation of these regulations shall be submitted to the Director of Personnel for decision through Dr. Auchter, who will send them through the office of the Chief of Bureau in the usual manner.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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Catching It ! What does a husband do when he misses the train on which he promised to be home to meet his wife? Right ! He catches it when he gets home. And what happens to that employee who refuses to take seriously the warning that he must stick closely to the Government's requirements as to ticket purchases and travel? Believe us, he catches it, too!

The Bureau's Office of Accounts has reminded us that effective June 1, 1936, the railroads comprising the Northeastern Passenger Association have reduced rates to 2 cents a mile for coach travel and 3 cents for travel where Pullman cars are occupied. The Southeastern and Western passenger associations have had reduced coach and Pullman rates for some time, with additional reductions for round-trip tickets. And here is where so many catch it! It is amazing how many suspensions have to be made due to failure to secure available round-trip tickets or to secure tickets with coach coupons for such portions of trips as are to be performed in coaches. The General Accounting Office is adhering very rigidly to the requirements of Government regulations that lowest available rates be secured.

Be careful, then, to secure round-trip tickets at reduced rates where available; and where part of a trip is to be made in coaches, a notation should be made on the face of the transportation request specifying the points between which coaches are to be used, and ticket secured with a reduced coach-fare coupon to cover coach travel. This will not only greatly expedite settlement of reimbursement vouchers, and reduce delay and correspondence with railroads in settlement of their bills, but may quite likely save you money.

NUT INVESTIGATIONS

J. R. Cole, Albany, Ga.

"There has been a considerable change in the attitude of the pecan growers toward spraying in the past year," he writes for the week ending May 9th.

"During the season of 1935, growers hesitated in letting us have plots because they were afraid of spray injury. They have a different attitude this year, however, after learning of our results in controlling the disease during the season of 1935. As a matter of fact, we have sent instructions for scab control to between 30 and 40 growers. The Schley variety has set a good crop of nuts in most sections, and the growers are anxious to control the scab disease, if possible.

"It appears that some varieties have experienced pollination difficulties. That is especially true of the Alley at DeWitt. The catkins were shed on this variety while the pistillate flowers were receptive, and a large percentage of the pistillate flowers have dropped. This is true of both sprayed and unsprayed trees. Here is my theory as to the cause: The low temperatures in April retarded the pistillate blooms, but it did not visibly affect the staminate bloom. Therefore, the pollen was either injured by the cold, or it matured normally in advance of the pistillate flowers."

C. E. Schuster, Corvallis, Oreg.

"The walnut blooming season is coming on quite rapidly in some sections," he notes in his report on general activities for the April 21-May 1 period,"but the blooming of the different varieties is completely out of line with other years. We have been unable to make satisfactory alignments in our pollination work."

Max B. Hardy, Albany, Ga.

"The weather for the week was clear, hot and dry," he writes from the U.S. Pecan Field Station and Laboratory on May 9th. "Unless rain is obtained soon it will be necessary to resort to irrigation, especially of the replants and nursery if damage is to be prevented. Crotalaria is showing signs of wilting during the day but no killing has as yet been noted. Except for the surface layer the soil still contains what appears to be an abundance of moisture. However, soil temperatures in the nutritional experiment where the ground has been cleared of plant growth are beginning to run rather high and irrigation of the trees in this experiment may soon be necessary."

HANDLING, TRANSPORTAION AND STORAGE AND MARKET DISEASE INVESTIGATIONS.

Cooking quality of potatoes. Increased interest in factors affecting the cooking quality of potatoes has been stimulated by the demand of restaurateurs and potato chip manufacturers in particular for dependable stocks of potatoes that will more suitably and uniformly fulfill their needs. In Technical Bulletin 507, just issued, entitled "The Cooking Quality, Palatability and Carbohydrate Composition of Potatoes," R.C. Wright, Walter M. Peacock, T. M. Whiteman and Elizabeth Fuller Whiteman place on record the results of their investigation of phases of the subject.

Several varieties of potatoes were stored within a short time after harvest at controlled temperatures ranging from 32° to 70°F. The Bureau of Plant Industry supplied the facilities for growing, harvesting and storing the potatoes, and made the chemical analyses, etc. The Bureau of Home Economics looked after the cooking tests, including baking, boiling, steaming, chip making and French frying of the various lots--and judged the products as to flavor, appearance, and other important characteristics. The latter was considered necessary as it is pretty well known that to Wright and his masculine associates in the investigations any sort of potato ranks as excellent. The fact that the potato chips, for example, might be lacking in aesthetic appeal, appearing mottled, dark brown, or even black, would mean nothing to them if the product tasted all right.

One of the things that makes the findings of importance is the fact that the general public is more particular and demands light-colored chips. The studies reveal that with the varieties used the type of product desired can be secured only with potatoes stored at 70° or 60° F. Those stored at 50° produce chips desirable in most ways, but not from the standpoint of appearance. From storage temperatures of 40° or below all varieties of potatoes studied produced chips of an undesirable type; in fact, chips made from potatoes stored at 40°, 36° and 32° were not edible.

When steamed, boiled or baked, potatoes from storage at 70°, 60° or 50° for several weeks were of a light-cream color, mealy in texture, and of a desirable flavor. Similar potatoes stored at 40°, 36° or 32° showed a change in color, became more soggy or watery, and the flavor was marked by an increase in unpleasant sweetness, a difference quickly noticed when tested along with those from the higher storage temperatures.

The carbohydrate composition of potatoes from storage at 60° and 70° was closest to that of newly harvested tubers. In those from lower temperatures the sugar content increased with the decrease in temperature.

These findings should help a lot in clearing up a bad situation that finds many restaurants at present having difficulty in late winter in securing potatoes from which they can prepare a uniformly good quality of French fried or baked potatoes.

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

"The major portion of our time during the past several weeks has been spent on our grape breeding work," he reports for the April 6-May 9 period.

"Buds have taken from this year's seedlings and budded on resistant stocks to further our studies in hastening the fruit production of seedlings. Similar seedling buds inserted in growing shoots last year are now showing fruit clusters and will produce ripe fruit, approximately 20 months from the time the grape seeds were planted in greenhouse flats, thus speeding up the fruiting of grape seedlings by about two years in obtaining one generation.....

"Individual vines on hand of the different lines of breeding include 756 F_1 seedlings, 2001 F_2 seedlings, and 131 back crosses."

M. A. Smith, Springfield, Mo.

Writing from the Ozark Fruit Disease Laboratory on May 9th, he said: "Since the low temperature of 17 degrees on April 2, observations in the Missouri Ozarks have indicated that the buds of such apple varieties as Duchess, Transparent, and Champion were almost all killed. Among the later varieties there was considerable variation. In some orchards Jonathan, Delicious and Grimes escaped with little injury, while in others all buds were killed. From the estimates of fruit growers in the district it is apparent that the apple crop will be about 25 percent of the normal. This low yield is due not only to the effects of the freeze but also to the fact that many varieties had a very light set of buds this season.

"From observations made to date in the block of Maiden Blush at Mountain Grove, it is apparent that the tar oil distillates have been very effective in the killing of apple buds. So far we have observed no spur or wood injury.

"Leaf variegation of Blakemore strawberry plants is very prevalent in this district this spring. A planting of Blakemores at Mountain Grove which was free of the disease last year is showing a considerable number of affected plants this season."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"Most of the time this week has been taken for observations on the conditions of cranberry vines on plots sprayed with Bordeaux as compared with unsprayed vines on a bog which is regularly flooded over winter to a depth of 24-30 inches," he writes in the report of the Cranberry Disease Field Laboratory for the week ending May 18th.

"The vines on the sprayed plots are of a good green color, the individual leaves being free from spots or blemishes and the percentage of dead terminal buds is relatively low. On unsprayed plots the vines are still quite red so that one can easily pick out the sprayed and unsprayed plots when looking from the edge of the bog. The individual leaves on unsprayed plots are red, with many brown or purplish spots and a rather large number of terminal buds are dead.

"A determination of chlorophyll in samples of leaves from sprayed and unsprayed plots brought out the fact that the former contain some 23 percent more chlorophyll than the latter. The same difference in vines on sprayed and unsprayed plots was observed on the same bog two years ago but chlorophyll determinations were not made at that time."

On May 12th he had reported that further cultures were made from fungus-infected seeds and seedlings of cranberries from crosses of last July. "Nearly all the fungi which cause fruit rots have not been isolated from seedlings but Diaporthe was the most often found in the isolations just made," he wrote.

"Losses from fungi on seedlings from crosses of last July were quite heavy but the surviving seedlings are now apparently well established and with somewhat warmer weather are making noticeable growth.

"Analyses have just been completed of some cranberry vines from a plot which received an application of copper sulphate at the rate of 2-1/2 tons per acre last August. Not a trace of copper could be found either in the press extract from the leaves or in the residue of leaf material after extraction of the sap. The vines were collected last week."

He had written on May 4th: "An experiment on the effects of copper sulphate solutions of different strengths on cell organizations was begun early in the week and later microscopic examinations of leaves were made. A microscopic study of leaf sections treated with colorimetric reagents for copper indicate that copper accumulates in certain cells much more extensively than in others."

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"A week of dry weather relieved by a good rain storm during the night of the 8th," he reports for the week ending May 9th. "The rain arrived at a most opportune time as the local strawberry crop is just starting to mature and the first pickings, made during the last few days, have consisted almost entirely of small berries with a consequent reduction in grade. The first shipments of strawberries went out by truck but carlot shipments are expected to start on May 11.

"The spinach growing season in the Ozark region is nearing a close this week with about 85,000 cases packed. It was expected that 350,000 cases would be packed this season but the dry weather of the last 30 days reduced the crop very materially. Most of the spinach is grown in the Arkansas River bottoms between Ozark and Fort Gibson."

Leslie Pierce, Vincennes, Ind.

"The precipitation for April shows a departure from normal of -1.22 inches, which brings the total deficiency since January 1st to 7.33 inches. The accumulated deficiency for the first four months of the year is approximately 50 percent of the normal rainfall for that period. No rain has fallen during the first nine days in May.

"It was estimated on April 27 that in Knox County, Ind. the early varieties of apple were showing 33 percent and fall and winter varieties 22 percent of a full crop of blossoms. This estimate was based on an examination made in 22 orchards comprising approximately 80 percent of the apple acreage in the County. In the low portions of practically all of the orchards from 10 to 50 percent of the blossoms were showing dead pistils and ovaries as a result of freezes occurring in April.

"The peach trees in our experimental orchard have produced a considerable number of leaves in the past ten days. At least 50 percent of the leaf-clusters are from adventitious buds. It now seems certain that very few trees in the orchard will die this season from the effects of the January freeze.

Paul W. Miller, Corvallis, Oreg.

"According to some weather statistics recently released by the Government meteorologist at Portland, Oreg., the month just closed was the dryest April that Portland has experienced in 10 years," he writes May 2, "and it also equalled the all-time low for April precipitation of 0.80 inch set in 1926. Normal rainfall for the month is 2.87 inches."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"It is generally recognized that the set of fruit in the Wenatchee valley is rather spotted," he comments in his report of May 19th. "In the Wenatchee district proper the set is light, although there will be enough for a good crop. In the Wenatchee river valley Romes and Delicious have set lightly and in other sections on the Columbia river the set will not be heavy enough to spray for.

"I noticed that in my Yellow Newtown blocks, where normally there are sets of from four to six fruits to the cluster, this year the sets are from one to three fruits to the cluster. This rather strongly indicates that one of two factors is operative in reducing the set of fruit this year--either the poor pollination weather or the devitalizing effect of the October and February low temperatures. The effects of these low temperatures are striking in the case of our Weeping Willow and English and Black Walnut trees. Very few of these have survived. Many were killed outright and the remainder are very severely injured.

"On the other hand, in certain other locations the set of fruit is extremely heavy, especially that protected along the sloping hills, such as the Ribbon Cliff orchard and the Cain orchard in the Squilchuck, all the trees having set a relatively high percentage of their blossoms.

"The cherry set is good in the Wenatchee district and fair in the Wenatchee river country. Cherries and apricots on Wheeler Hill are a total failure this year, although the apricot crop in East Wenatchee will be fairly good.

"Mr. Reeves is having considerable difficulty in his powdery mildew experiments this year. Orchard sections where he could normally find plenty of mildew, are entirely clean this year. The greatest amount that he could locate was at Peshastin on some Delicious trees, but the entire orchard did not have as much mildew this year as one tree in his experimental plots there last year.

"He spent practically one whole week trying to locate an orchard in which to try out some new sprays. He is doing considerable work on little leaf this spring and also checking on the possibility of using boric acid for cork spot control.

"Many of his cherry plantings of last year, in connection with mottle leaf studies, were winter injured and he is planning to replace these with new trees this year."

ADMINISTRATIVE NOTES

Picnic The annual Division picnic at the U. S. Horticultural Field Station, Beltsville, Md., one of our best assets in building up the fine esprit de corps existing among our workers, was held from 2 p.m. onward, Saturday, May 23. It was unusually well attended, some 250 employees and members of their families being present. The success of the affair speaks well for the efficiency of the various committees --the same that handled the picnic last year.

Dr. Magness looked after the men's games, while Dr. Cullinan planned (with capable feminine assistance) those for the women. Mr. Gould again served as chairman of the hospitality committee, and Mr. C. A. Reed looked after the children's games. To Mr. M. M. Ramsburg, who was both chairman and committee on lights goes deserved praise for the effective lighting that permitted the affair to continue well into the evening. Last, but decidedly not least, was Mr. J. H. Beattie and his Refreshment Committee. Strawberries, ice cream and coffee were supplied by this Committee, employees bringing their own basket lunches.

A wide variety of field games kept the gathering interested, these including not only baseball but archery, races, rolling-pin tossing, etc. The only saddening feature of the occasion was the manner in which Mary Fowler probably damaged her matrimonial chances by demonstrating amazing power and accuracy in winning the rolling-pin throwing contest.

While the administrative force won both of the baseball games, the research staff rather snatched the spotlight. The sparkling feature of the games was a startling catch by outfielder Johnny Weinberger, shutting off an administrative homerun. Dr. Magness not only pitched well for the research team in the first contest, but upset all pitching traditions by lining out three clean hits. Mr. D. F. Fisher covered a lot of ground in the outfield, including a number of tumbling specialties in his performance.

A good bit of envy was aroused after dinner (or was it supper?) by the skill of Dr. Auchter who, attached to three yards of cheesecloth, established a new speed and efficiency record in the handling of dishes. This work was done as a "pinch hitter" for Carl Schoenhals who tackled the job in the beginning but who soon faded away under pressure.

Incidently, the "Log Cabin" headquarters of the Beltsville station has added to its collection of trophies the Agriculture bowling championship cup, taken over permanently by the Plant Industry team (captained by John A. Ferrall of our staff) on the final night of the 1935-36 season--May 21.

------Wayne Guernsey

ADMINISTRATIVE NOTES

Typewriter ribbons - Carbon paper, etc. Circular Letter No. 156, recently mailed to heads of departments and independent establishments by the Procurement Division of the Treasury Department, contains so much of interest and value to our personnel that we are quoting it practically in full.

"Complaints about typewriter ribbons and carbon paper have been more persistent than on any other article furnished from the stock of the Procurement Division," it says. "Their character shows that in some instances they have been due to unsatisfactory quality, while in others they have resulted from inaccurate choice of degree of inking of ribbons, or of weight or coating of carbon paper, to meet particular needs. The revision of specifications for these articles, in order to improve the quality to meet all practical requirements, is being given earnest study and developed steadily, but proper selection and application of suitable types of these commodities to purposes for which they are definitely intended necessarily rests with the users.

"Since Federal Warehouse stock items must be replenished through competition, inevitably new brands are introduced from time to time. Consequently stock requirements should be specified by ordering agencies, and will be filled by the Procurement Division only on the basis shown in the Schedule of Stock Items. 'Brands' should not be specified in ordering stock items. Because of the large number of operators and others who do not know of the variety in which these articles are available from the Procurement Division stock, and who also are not acquainted with the properties of each of the various grades, certain fundamentals are presented below:

"Typewriter Ribbons

"Typewriter ribbons are carried in stock in heavy, medium and light inkings. These inkings are necessary so that legible typing may be expected irrespective of the kind of typewriter used, the style of type, or the touch of the operator. It is easily understood that if there were but one kind of inking, the legibility of typed matter would vary greatly between work done on a machine with very large type and that from a machine with very small type; also, that work done by different operators with touches ranging from heavy to extremely light would vary similarly.

"In general, the larger and bolder the type the more the need for a ribbon with heavy inking, and the smaller the type the more positive the need for light inking. The medium inked ribbon offers an in-between range. It may be stated that the medium inking represents the maximum necessary for any ordinary correspondence or record work, and that there is a justifiable preference for lightly inked ribbons for use with elite and other small type.

ADMINISTRATIVE NOTES

"The density and clearness of typed matter depend largely on the degree of inking chosen, the operator's touch and the cleanliness and perfection of the type, the latter two factors having particularly important bearing with the smaller type.

"A heavy-inked ribbon should not be used where many carbon copies are desired--light inking should be used for many copies.

"Complaints of uneven inking are seldom justified. The manufacturing process makes such fault highly improbable. Unevenness in typed matter is usually traceable to faulty operation of the ribbon feed or irregularity in the operator's touch, even slight variations in touch being disclosed increasingly as the supply of ink in the ribbon runs low. The important properties of typewriter ribbons are clear, legible printing, durability and freedom from type-filling fault.

"Carbon Paper

"The 'weight,' i.e., the thickness of the base paper on which the carbon is coated, is of primary importance in considering durability and in connection with the number of copies to be made at one operation. Standard weight is preferable for making from 1 to 4 copies inclusive. The value of this weight lies in its serviceability, i.e., its capacity for reuse many times in making comparatively small number of copies satisfactorily. Light weight is intended for making 5 or more copies. The chief value of such carbon is measured by its capacity for producing a large number of legible copies at one time, rather than by the number of times the same carbon may be reused for such purpose.

"The 'coating,' i.e., the finish, of the carbon paper is important to consider in connection with both the number of copies required and the handling to which the copies may be subjected. A hard coating gives a ra ther grey but clear copy and wears best. With hard coated carbon, smudging and blurring are at the minimum. A soft coating gives a much blacker copy, but because of its softness has more tendency to smudge and to blur as the number of copies increases. It is also less durable for reuse and clean erasures thereof are difficult to make.

"A medium coating is between the hard and the soft. Ordinarily a medium coating is used with both pica and elite type machines for ordinary work, although many operators of machines equipped with pica type prefer the hard finish.

"Weights and coating, as discussed, are stocked in the Procurement Division Warehouse for common requirements.

"While some operators of 'noiseless' machines find satisfactory results by using a soft coating, others prefer the medium or light coating, and a light weight for a larger number of copies.

ADMINISTRATIVE NOTES

"Both the hard and medium coatings of standard weight carbon are commonly used with satisfaction in making relatively few copies, the choice being made in view of related conditions, such as the number of copies, touch of the operator, character of typewriter paper, etc. Many operators find better results with 5 to 7 copy work through the use of medium coated, light weight carbon, reserving the hard coated, light weight for use where more copies are required.

"In warm weather, especially during humid periods, carbon tends to curl, particularly with light weight. This is unavoidable.

Typewriter Paper

"The thickness and character of matter between the type and the platen have a definite bearing on the quality and number of carbon copies possible. Thus, if a comparatively stiff, heavy paper must be used for the original, and comparatively heavy paper for the follow sheets, the copies will lack the same degree of legibility that would have been possible if a thinner and more flexible typewriter paper had been permitted. It follows, therefore, that the thinner the original and follow sheets and carbon paper used, the better the copies. Carbon copies on glazed paper are usually less distinct than on unglazed paper.

Care and Operation of Typewriting Machines

"Keep the type clean. 'Definition' (the sharpness of the typed matter) is at its best when the type is kept scrupulously clean and renewed when it becomes worn. Avoid a too-heavy touch. Make it positive and uniform. A hard platen is more satisfactory for several copies and where many carbons are regularly required a brass platen may give superior results. It should be remembered, however, that hard platens shorten the life of both ribbons and type. The surface of the platen should not be allowed to become slippery or marked by punctuation characters. A platen with slippery surface often causes irregular spacing between lines of carbon copies. A pitted platen causes illegible typing and more rapid wear on the ribbon and cannot produce good copies. Platens in poor condition should be renewed.

"Pica type (i.e., the larger common type) will ordinarily give more readable copies with less attention to precautions than the smaller elite type. The smaller the type the more exacting the requirements for good work.

"'Noiseless' machines respond to the same general principles as to selection of ribbons and carbon as standard machines. 'Noiseless' machines are equipped with a pressure dial, a device to be adjusted to the number of copies desired. Such device should be appropriately set to govern the impact of the type against the platen.

ADMINISTRATIVE NOTES

"Type which has had long hard service is very apt to have become so worn that it is incapable of making good sharp copy, either original or carbon. In the interest of legible work such worn type should be replaced.

In General

"Various factors influence the wear and performance of typewriter ribbons and carbon paper. Therefore, in judging quality of results and durability of materials, the relative freshness of stock (e.g., ribbons should not be dried out from age or improper storage in high temperatures), the size and cleanliness of type, the operator's touch, the hardness and condition of the platen and the character of papers used, all have legitimate claim to consideration before judgment is passed. Also, opinions differ as to what is satisfactory print or copy.

"It is well known that, due to differences in touch and the condition in which typewriters are maintained, the same ribbon or carbon, used on the same kind of machine and for the same kind of work, will give widely different results with different operators. Specifications on which ribbons and carbon are purchased are exacting; the tests to which these supplies are subjected before acceptance are more severe than actual normal use. It is, therefore, believed that if the proper grade is selected, and reasonable care is exercised as to the other factors involved in doing good work, more satisfactory results will be obtained.

"The operator's personal experience in trying different supplies in actual work should be helpful toward citing the weight, coating, etc. of such supplies to meet his particular need.

"These comments are submitted in the belief that their circulation among supervisory employees, particularly stock and typing groups, urging careful observance, will be helpful toward economical issue and use, improve typed and carbon work and also serve as a convenient reference in weighing the merits of complaints."

Roy Gillette says he will be glad to entertain orders for any grades desired by our personnel. Medium grades of ribbons and carbon paper are carried in stock; the other grades can be ordered. He adds that typists should use care to see that the type on their machines is kept absolutely clean--and this is easily managed through the use of standard type cleaners, brushes, etc. carried in stock. Too, platens of typewriters may often be improved by rubbing them with gasoline--or perhaps sandpapering the roller slightly and then cleaning it with gasoline. We find, too, that better results are usually secured by using the so-called "50 percent rag" thin paper for making carbon copies. It gives better copies than the glazed paper, called "onion skin."

ADMINISTRATIVE NOTES

Transportation of Household Effects

In view of a decision, A-69595, dated March 16, 1936, received from the Comptroller General, authorizing reimbursement for amounts expended not only for freight, but also for packing and crating and unpacking and uncrating, when reasonably necessary for the transportation of household effects, Memorandum No. 692 from the Office of the Secretary, dated May 14, 1936, notifies us that Fiscal Regulation No. 37 is amended, effective immediately, to read as follows:

"An employee transferred from one official station to another for permanent duty, not for his own convenience, may be allowed his traveling expenses and charges for packing, crating, drayage, transportation, uncrating and unpacking of his household goods and personal effects, including animals for domestic use, and personal property, which will be used in official work at the new station, excluding motor vehicles, whether the shipment is from the old post to the new, or from a previous post to the new, or, if specifically authorized by the Secretary of Agriculture, partly from the old post and partly from some previous post to the new. The authorization must be in writing, may be issued by a chief of bureau; regional forester, Forest Service; district engineer, Bureau of Public Roads; or regional conservator, Soil Conservation Service; and must state that the transfer was not for the employee's convenience.

"The transportation of property may be authorized only within one year after the date such officer is permanently assigned to an official station within the continental limits of the United States and within three years after the date such officer is permanently assigned to an official station outside the continental limits of the United States, except that in special cases where in the judgment of the Secretary of Agriculture the facts warrant, he may authorize such shipments subsequently notwithstanding the expiration of the specified period. The term 'official station' includes a suburb of the city in which located.

"The shipment shall be by the least expensive means, including truck or van where practicable, taking into account all allowable costs above specified, but express may be used for perishable articles or those required for immediate use at the new post, as wearing apparel, tableware, bedding, and kitchen utensils (not furniture or jewelry), where alternative transportation would be inconveniently slow. Freight shipments should be on Government bills of lading with release to the lowest valuation, which must be specified. Carload rates should be secured where cheaper. Competition is required when the amounts exceed $50 for (1) packing and crating, (2) drayage, (3) truck or van transportation, and (4) uncrating and unpacking."

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., June 15, 1936 No. 12

Surprisin' Katahdin! One of the weekly magazines states that when a hunter appeared recently at the courthouse in a Wyoming town to claim a wolf bounty, he received a big surprise. The animal he had shot and skinned was really the sheriff's pet police dog!

But speaking of surprises, how about the surprisin' Katahdin potato? It seems to us that Dr. C. F. Clark and Dr. F. J. Stevenson have brought in a real "wolf skin" in this instance, and richly earned the bounty. This potato, of course, was obtained in connection with our program to secure varieties resistant to mild mosaic, but it is showing such astonishing quality and productiveness that growers are losing sight of the fact that disease-resistance is supposed to be its chief recommendation.

Writing in the Seed World for May 22, C. H. Metzger, associate horticulturist of the Colorado Experiment Station, tells us that the Katahdin is gradually replacing the Rural New Yorker potato in sections of Colorado. "This past year," he reports, "four growers in Montrose county obtained yields of more than 600 bushels of Katahdin to the acre." The tubers are smooth, with few, shallow eyes, a shape that the Katahdin maintains amazingly well under even adverse soil and climatic conditions. It consistently produces a very high percentage of No. 1 potatoes, and has a tendency to set tubers early, a characteristic that gives it an advantage over the varieties of the Rural group in many locations. It is so resistant to mild mosaic that in the dozen years the variety has been under observation at Presque Isle, Me., for example, not a plant has been found infected with this disease in the field. All in all, potato specialists prophesy that this one hybrid will repay American tax payers for the cost of potato investigations since the Department was created. Yes, we've earned the bounty! The Katahdin is no police dog--it's a wolf!

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

Reporting for the week ending May 30th, he writes: "Most of the week was spent in supervising the application of spray preparations for the control of walnut blight to test plots of walnut trees located in a Franquette orchard near Scholls, Oreg. This finishes up the spraying program in this orchard for the current season.

"Results of tests on the effect of the use of certain kinds of oils and other supplements with bordeaux mixture on the relative amount of foliage burn were also taken during the week. The tests in question were carried on in a grafted Franquette orchard near Schools, Oreg. Very little, if any, foliage injury was noted in plots sprayed with bordeaux mixture 2-2-50 plus herring oil, 1 pint to 100; salmon oil, 1 pint to 100; a light mineral spray oil, 1 pint to 100; a dormant spray oil, 1 pint to 100; and a light medium oil emulsion, 1 quart to 100, respectively; whereas considerable leaf burn was evident in the plots sprayed with bordeaux mixture 2-2-50 alone."

He had written on May 16th: "The forepart of the week ending May 16 was spent in prune russet studies. A number of tagged prunes in an Italian orchard near Amity, Oreg. were examined for evidences of russet. Relatively large brown spots of variable sizes and shapes were found on a number of these tagged prunes. For the most part the affected fruits were located in contact with, or in the vicinity of, leaves or twigs which in all probability would rub against the fruits in a windy period.

"Observational evidence would seem to indicate that leaves, particularly the serrated leaf margins, are apparently more important in the production of russeted areas on the prunes than are twigs and branches. Russeted areas are now plainly visible on caged fruits which were experimentally rubbed about the time the shucks were falling from the fruits.

"On the other hand, thrips infested caged prunes show no evidence thus far of typical russet. However, on some of the thrips infested prunes there are some very small brown areas at the apical end which may be associated with the feeding of thrip nymphs. In no case, though, do the fruits show large typically russeted areas on the sides of the prunes.

"The latter part of the week was spent in supervising the application of spray preparations for the control of walnut blight to test plots of walnut trees located in a Franquette orchard near Aumsville, Oreg. This is the second general application.

"The first current blight infection was found on walnut foliage during the week at Aumsville, Oreg.

VEGETABLE INVESTIGATIONS

H. L. Blood, Logan, Utah.

"The cool pleasant March weather and unusually heavy snow storm of March 31st was followed by an extraordinarily hot, dry April," Dr. Blood writes to Dr. Doolittle under date of May 19th. "The heavy blanket of snow which appeared to be ample to remain with us for some time quickly disappeared as one of the hottest Aprils in the history of the Intermountain country set in. Drying winds accompanied the heat with the result that as the month passed the farming lands dried very rapidly.

"The April heat and drought was relieved by a brief storm during the first few days of May. During this storm period a light frost struck the plains area west of Ogden in the Salt Lake Valley the night of May 5th. The frost did little damage except to the tomatoes that had been set into the fields. Since the early May storms the weather has been hot and dry as before. On May 12th the official temperature registered at Logan, Utah was 90°F. As a result of the unusual heat and drought field crops are having to be irrigated much before the usual date.

"A very interesting type of damage is now appearing in the pea fields of the Salt Lake Valley west of Ogden. Beginning at the surface of the ground and for one to two inches downward the stems of the infested pea plants are shriveled and discolored a light brown. The destruction appears to resemble very closely a reaction to scalding, rather than a reaction to parasitism. No fungus or bacterium could be detected by microscopic examination of the tissues. The destruction is general over the entire pea growing section of the valley west of Ogden, but is much more extensive on the light sandy loam soils where a great many acres have been entirely destroyed. The mid-April heat and drought period was at its height just after the peas had emerged. The evidence appears to indicate that the damage might be attributed to a burning of the tender tissues of the young pea stem by the extreme heat and drought prevailing at that time.

"Tomato plantings attempted on our Trial Grounds at Hooper, Utah, May 12th, 13th and 14th were only moderately successful due to the intense heat wave prevailing during that period. Ordinarily tomatoes are planted in this section from May 10th to 20th, but this year all plantings during the early part of this period were made with difficulty due to the heat. At present the weather has cooled off and the tomato planting campaign is in full swing.

"Plantings were made on our Hurricane Trial Grounds May 8th and 9th. We were fortunate in the selection of these dates as the cool weather prevailing northward earlier had modified the temperatures sufficiently to favor transplanting."

DECIDUOUS FRUIT INVESTIGATIONS

C. F. Kinman, Sacramento, Calif.

Writing to Dr. Cullinan on May 23d, he stated that one-half a day has been given to a study of unproductive cherry trees and branches, or "cherry crinkle" as it is called.

"Healthy scions that I selected for grafting into nonproductive trees seven years ago produced a heavy load of fruit from top to bottom this year," he wrote, "and their leaves are normal. These long, slender branches with their load of fruit growing along the 'crinkle' branches that are growing up around them from the lower part of the tree furnish a striking contrast with those useless branches. In this and in many other instances I have still been unable to find indications that the trouble is contagious."

Elmer Snyder, Fresno, Calif.

"Practically all of the grape crosses outlined for this season's work were completed during May," he writes May 30th. "Due to frost injury occurring on March 23-25th, clusters in various stages of bloom could be located on the parent vines. Some clusters were in full bloom while others produced on new shoots starting after the frost injury were in the proper stage for emasculation.

"The grape breeding work this season included approximately 10,000 emasculations and crosses, involving 25 combinations. Forty varieties and seedlings were selfed to continue studies on dominant factors,

"Some preliminary studies were conducted to ascertain the thermal death point of the pollen looking forward to more rapid emasculation by heat applications."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"We have had a bad year here so far as the almond is concerned," he comments in a letter to Mr. Gould, dated May 23d. "We had so much rain that crops did not set on some of the orchards and in those that escaped the pollination difficulties due to the rain, frost did considerable damage. I believe the almond crop will be lighter this year than for any year since I have been on the almond work."

DECIDUOUS FRUIT INVESTIGATIONS

H. J. Bergman, Amherst, Mass.

"Further reports on frost injury to cranberries continue to come in," he reports for the week ending May 30th. "The estimated crop loss due to frost is now placed at from 10 to 15 percent .... Dusting and flooding of bogs for control of black-headed fire-worms is now in progress."

He had written May 22d: "Further comparisons of the chlorophyll content of cranberry leaves from vines on plots sprayed with bordeaux during the summer of 1935, and of leaves from vines on unsprayed plots were made this week. The results were similar to those of last week, the leaves of vines from sprayed plots have a higher chlorophyll content than those of vines from unsprayed plots. The difference was not as great in all samples as that found in the measurements made last week, but the difference is very clearly defined. Many more lateral branches are developing on uprights of vines on unsprayed plots than on those of vines on the sprayed, due to the death of many more terminal buds on the former.

"Quite heavy frosts occurred on Thursday and Friday nights of this week, with temperatures ranging from 23 to 29 F. The strawberry crop in eastern Massachusetts is reported as killed, but the blueberries are apparently uninjured."

John C. Dunegan, Fayetteville, Arkansas.

"Apple blotch (Phyllosticta solitaria) was observed on non-sprayed Ben Davis fruit today (May 29) for the first time this season," he reports for the week ending May 30th.

"According to local newspaper accounts, about $160,000 cash was brought to Washington county farmers from the strawberry crop during the marketing season just closed, it is estimated by growers.

"While the crop was considered only about 40 percent of a normal yield, on account of the early drouth and rains coming at the wrong time, the berry growers generally are well pleased with the returns.

"The County shipped out 58 cars by rail from the three shipping points in the county, and the average price for the berries shipped was $2.60 a crate. In addition, about 100 cars were trucked out, with the price running a little lower on the trucked berries. About $2.35 was the average price received for the berries which were marketed by truck.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark. (continued)

"The present outlook for grapes is that there will be about 50 percent of a normal yield. This varies considerably over the country, with some vineyards higher and some lower than this average prospect. The late freeze which cut the grape crop outlook in half did considerably more damage to apples, and present indications are that the average will not be above 10 percent of a normal apple crop."

He had written May 23d: "According to Mr. C. Woolsey, extension horticulturist of the University of Arkansas, the 1936 Arkansas peach movement will be from 1500 to 2000 cars. The Nashville section will ship about 1200 cars, the Crowleys Ridge section 200 to 300, and the other sections will have scattered shipments.

"Mr. Woolsey visited the Nashville section immediately after the April 1 freeze and said that the condition of the orchards at that time was very interesting. The fruit of the early blossoming varieties such as the Elberta had shed the calyces before the freeze and in most instances escaped injury, while the later blooming varieties, with small peaches just beginning to shed the calyces, were badly injured.

"He said it appeared as though a difference of two or three days in the age of the fruit made the difference between susceptibility and non-susceptibility to the low temperatures, with the older and larger peaches escaping injury.

"In the Nashville section the trees on the lighter land, where they would be more advanced in development, suffered very little, while trees on heavy land and hence somewhat slower in coming out, had practically the entire crop destroyed."

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

"Because of the continued rain we were able to do but little planting during the week," he writes on May 30th. "It is doubtful if more than half of the commercial crop has been planted. At this date planting is generally finished in this section of the country.

"The rainfall for May, up to the present date, has been slightly in excess of 6 inches. This is approximately 3.5 inches more than the average for the month."

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

"In studying factors which effect the set of fruit in Anjou, I have observed that of the 8 blossoms in a cluster (located spirally around the peduncle) the lower two or three are those that open first, and are also those which set and hold fruits," he writes from the U. S. Pear Field Station on June 1. More specific data were obtained this spring:

Upper 6 blossoms removed, lower 2 blossoms left.
Final set of fruit -- 3.2 percent.
Lower 6 blossoms removed, upper 2 blossoms left.
Final set of fruit -- .5 percent.
All blossoms in 3 out of 4 clusters removed.
Final set of fruit -- 2.3 percent.
Check -- No blossoms removed. -- 2.0 percent.

"These data show why Anjou trees, which had all blossoms seriously injured by the freeze (just before full bloom) except the 2 or 3 which opened last, now do not have as much as 25 to 37 percent of a normal crop. The 2 or 3 late-opening, weak blossoms were apparently uninjured, it is true; but although they initially set some fruit, this fruit did not 'stick'. In other words, the late-opening, weak blossoms are less likely to set than the more vigorous, earlier opening blossoms.

"Fruit measurements in the 'wet' and 'dry' plots at the Topsides and Kenly orchards were started. The 'wet' plots at the Topsides orchard were irrigated. In the laboratory, analysis of fruit samples taken at harvest in 1935 from the pruning-irrigation plots was completed. Total sugar and hemi-cellulose determinations on root samples taken on May 13 1935 in the pruning plots in Block 4 failed to show any lower sugar or hemi-cellulose content in the roots of trees receiving moderate or heavy pruning than in the roots of trees receiving no pruning the previous winter.

"If the temporary reduction of leaf area on the pruned trees reduced the carbohydrate supply to the roots, the reduction was too small to be detected by analysis. At present I suspect that the temporary reduction of leaf area by dormant pruning actually increases the total carbohydrate manufacture by the tree, because the smaller leaf area permits an improved water supply to the leaves during the period of higher transpiration. But I cannot entirely explain the continued greater total carbohydrate manufacture by heavily pruned trees late in the summer, when their leaf area seems to be nearly as great as that on unpruned or moderately pruned trees."

ADMINISTRATIVE NOTES

Long-distance Telephone calls — At a recent meeting of the National Emergency Council, the President directed that hereafter, except in unusual circumstances, official long-distance telephone calls should be made on a station-to-station basis, and not on a person-to-person basis. The following administrative regulation for the Department has been issued, effective July 1, 1936:

"729. Long-Distance Telephone Calls:

"Long-distance calls may be made only when the nature of the business to be transacted is urgent, cannot be adequately transacted by mail or telegraph, or is of such a character as to require personal contact. Within these limitations, any employee whose duties necessitate expenditures for telephone calls is authorized to incur expense for official long-distance messages, subject to the discretion of the officer in responsible charge of the unit to which such employee may be attached. Except in unusual circumstances, all official long-distance telephone calls shall be made on a station-to-station basis and not on a person-to-person basis.

"Toll charges in excess of 50c for long-distance telephone calls on official business will be allowed only when a certificate is furnished showing:

1. Bureau;
2. Division;
3. Name of person making call;
4. Name of party with whom communication was held;
5. Points between which service was rendered;
6. Date of call;
7. Number of minutes;
8. Charge as to initial period, additional minutes, and total;
9. Type of call (station-to-station, person-to-person, report charge, messenger);
10. Statement that the call was on official business.

"Employees making an administrative examination of accounts are instructed to suspend from vouchers any toll charge for a call exceeding 50c unless such a certificate signed by an authorized administrative officer is attached. Failure to furnish a certificate promptly shall be reported to the proper administrative officer. Telephone calls made in the field may be reversed and charged to the unit called, provided such call is official and the reversal is acceptable to the officer in responsible charge of the unit called. In such instances the party accepting the call will be responsible for the submission of the certificate. Certificates on reverse calls received in Washington will be prepared by the telephone operator."

ADMINISTRATIVE NOTES

Automobile Reports. In closing out financial matters for the fiscal year do not overlook the fact that all reports on Government passenger-carrying automobiles and trucks used mainly for passenger carrying service must be in as soon as possible after the end of June. One report delayed means that the semi-annual report of the Division to the Chief of Bureau is held up.

Supplies Every effort is being made to obtain supplies ordered by our stations and forward them as promptly as possible. Many items ordered are obtained from the Central Stores section of the Department and their method of filling orders by "back-ordering" many items sometimes means that the order will not be completed for some days--or even weeks. For this reason it happens now and then that some of the items ordered have to be sent later. If any item is urgently needed, we should be advised so that if it is not in stock here an effort can be made to secure it elsewhere as promptly as practicable.

Rental Agreements With the end of the fiscal year so near, have you checked carefully your requirements for the Fiscal Year 1937 and submitted short term rental agreements for experimental plots, garage space, ice, laundry service, etc.? It is noted that some of our field representatives who had contracts for such services the past year have not submitted new contracts--and such new contracts must be in by June 30. Every short term rental agreement, telephone contract, and utility contract should be sent in for approval and completion before the beginning of the new Fiscal Year, July 1.

Injuries There have been several instances recently where injuries sustained by employees in the performance of their official duties were not reported immediately. Sometime ago every field office was furnished full instructions regarding the regulations and procedure in reporting injuries to the U.S. Employees' Compensation Commission, with the request that all members of the field force familiarize themselves with these instructions and govern themselves accordingly. If you have not seen a copy of these instructions or do not have a supply of the Compensation Commission forms, advise Mr. Gillette at once.

Appointments Attention is again called to the necessity of anticipating the need for assistance sufficiently in advance to have the appointment questionnaire reach us at least two weeks in advance of the desired effective date of the appointment.

ADMINISTRATIVE NOTES

Certifying Vouchers. Just a little more about the importance of care in certifying vouchers for payment! Under Executive Order No. 6166, dated June 10, 1933, the disbursing functions previously handled by the Department were transferred to the Treasury Department. A paragraph of that order reads:

> "The Division of Disbursements shall disburse moneys only upon the certification of persons by law duly authorized to incur obligations upon behalf of the United States. The function of accountability for improper certifications shall be transferred to such persons and no disbursing officer shall be held accountable therefor."

This doesn't mean, however, that disbursing officers are relieved of responsibility where improper payments are made by them. It is fundamental that disbursing officers of the Government are bound to account faithfully and fully for all moneys intrusted to their care, and in so accounting they are personally liable to the United States for such moneys for which they fail to show lawful use. If an account is certified to a disbursing officer for $25, say, and check improperly drawn by him for $30, the responsibility rests solely upon him and he must make good the overpayment. It is up to him to get the money back from the person receiving the overpayment, or from the employee who made out the check incorrectly.

While the responsibility of certifying officials does not lessen the responsibility of the disbursing officer and his surety in their liability to the United States, where it is shown that an erroneous or illegal payment was caused solely by an improper certification as to matters not within the knowledge of or available to the disbursing officer, the accounting officers of the Government may and will raise a charge directly against the certifying officer for the amount of such payment.

The complicating angle in the matter is the provision that "The Division of Disbursement shall disburse moneys only upon the certification of persons by law duly authorized to incur obligations upon behalf of the United States..." Offhand, it appears that the power to certify and approve vouchers for payment may not be delegated to any person who is not "by law duly authorized to incur obligations on behalf of the United States."

It is clear, however, that employees who sign vouchers certifying to their correctness will be held personally and financially responsible for any overpayment or improper payment. We have always expected care to be exercised to see that no voucher is sent in for payment until it is known to be correct and legal, but the centralization of check drawing in the Treasury Department makes such care even more desirable as it will undoubtedly be difficult to secure relief from Congress in future for an employee who may be responsible for an improper payment.

ADMINISTRATIVE NOTES

Letters of Authorization — Copies of letters of authorization for the fiscal year beginning July 1, 1936, will be mailed out shortly. It is vitally important that these be read carefully so that you may be sure that they cover your needs. Too, there may be some slight change here and there from the authorization issued to you last year. If the authority given will not cover your needs, please notify Dr. Auchter promptly in order that he may consider the desirability of an amendment.

As we have pointed out before in the NEWS LETTER, it is essential that you understand that a letter of authorization simply establishes a credit and the amount of the letter should be treated exactly as you bank account--and the general provisions of the authorization must be regarded in the same light as any other instructions given you officially. Unless an employee keeps a careful check on his expenditures and lives up to the general provisions of the authorization, the letter becomes to all intents and purposes useless, for accounting officers assume that when a man is given a definite authorization he will live up to it. A close tab on money available in an authorization is perhaps even more important than a check on your bank account, since an overdraft is likely to cause even more embarrassment.

In most cases of suspensions from accounts by reason of the employees failure to live up to the provisions of his letter of authorization there is not the slightest question about the accuracy of his explanation for the neglect; nor is there any question about his honesty. The question is merely one of bookkeeping. No employee should expend funds, perform travel, use a personally-owned automobile, or incur expenses of any kind until he is sure that the work involved has been authorized.

The Business Office has a supply of forms to be used in keeping a record of expenditures under letters of authorization. These will be furnished upon request. It has been suggested that when you are away from your headquarters on a trip you carry your authorization with you, listing on the back the amount allowed for the trip, as well as each expenditure, including transportation requests and the day's per diem at the end of each day. Then by adding the total expenditures and subtracting from the amount allowed you can keep track of your balance and ask for an increase should you find that the money allotted will not be sufficient to carry you back to your headquarters.

Send in your vouchers promptly, especially this month, so that we can close up accounts for the fiscal year ending June 30 as soon as possible. It will assist the Business Office very much if you attach a note to the last voucher to be charged to the 1936 fiscal year funds, so that it will be known definitely that no other expenditures will be charged to your allotment. Especially bear in mind that carbons of transportation requests must be sent in as soon as tickets are purchased. No bill from a railroad can be paid until the carbons of all requests charged thereon are received for checking the account.

Vol. 8 No. 12 June 15, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., July 1, 1936 No. 13

Jerusalem Artichokes

Ours is a research Division. All of our activities rest on this basis. So we have a good opportunity to see that it is all wrong to think of research as merely increasing production. What it actually does is to increase efficiency in production. Diseases and pests could be relied upon to decrease production, but they would not do it profitably and the farmer still has to figure his profit as the difference between what he gets for his crop and what it costs him to produce it. In the case of the Jerusalem artichoke we have been helping the growers by cautioning them regarding this crop.

"Although the Jerusalem artichoke (Helianthus tuberosus L.) is native to North America and its culture has been developed on a rather large scale in some parts of Europe, the crop in the United States has remained unimportant except in a few localities," says Technical Bulletin No. 514, "Studies of the Culture and Certain Varieties of the Jerusalem Artichoke," by Victor R. Boswell, C. E. Steinbauer, M. F. Babb, all of this Division; W. L. Burlinson, head of the department of agronomy of the Illinois Agricultural Experiment Station; W. H. Alderman, head of the department of horticulture, Minnesota Agricultural Experiment Station; and H. A. Schoth, agronomist, Division of Forage Crops and Diseases, Bureau of Plant Industry, cooperating with the Oregon Agricultural Experiment Station.

"A widespread interest in the plant has developed in this country only within the last decade or so, and largely as a result of its possible value as a source of raw stock for the manufacture of levulose and of alcohol.

"The interest in the crop and the seemingly immediate future possibilities have resulted in some unfounded and overenthusiastic optimism and in a number of rather ill-fated commercial ventures. The misfortunes accompanying certain unsuccessful crop-production projects were doubtless due (1) to limited demand and inadequate market facilities for the crop, and (2) to an almost complete lack of information concerning the yields reasonably to be expected, the adaptability of the crop, soil and climatic requirements, cultural methods, and particularly the labor requirements. The culture of the Jerusalem artichoke appears to offer no more possibilities for easy profit than numerous other farm crops that are extensively grown at present. With the commercial outlet as limited as it is at this writing (1936), growers should carefully determine in advance of planting how their crop can be marketed.

"The present interest in the crop and the necessity of obtaining sound basic information in preparation for possible future developments have demanded that certain studies be made. These studies were designed to furnish a basis for developing an economical and efficient system of culture and to prevent as far as possible costly and even disastrous experiences of farmers and others. It is doubtless more important to understand the limitations of a 'new' crop than to know merely what a few unusually successful persons have accomplished with it.

"In addition to providing immediately valuable practical information on the growing of the Jerusalem artichoke, this cooperative program of study has offered an opportunity to add to the knowledge of the response of plants to different environments. The results are of fundamental as well as practical interest.....

"The Bureau of Plant Industry and a number of State agricultural experiment stations had conducted independent investigations on the Jerusalem artichoke for a number of years prior to 1930. In late 1930 plans were developed jointly by representatives of the Bureau and of the experiment stations of Illinois, Louisiana, Minnesota, and Oregon for conducting comprehensive studies according to a procedure as nearly uniform as possible for all locations. The Bureau furnished the planting stock of numerous varieties so that all workers would be using identical plant material....

"The individual plot data obtained by the several writers, together with notes and comments, were sent to the senior writer, who prepared the tables, made the statistical analyses, and prepared a rough draft of a report, which was then jointly worked into form for publication. This plan insured uniformity of treatment of the material and at the same time enabled each investigator effectively to bring out important local observations and interpretations of results...."

Results of the cooperative studies of 20 varieties and certain cultural practices are reported, the investigations being conducted at Arlington Farm and Beltsville; Urbana, Ill.; in cooperation with the Illinois Agricultural Experiment Station; at Excelsior, Minn. in cooperation with the State station; at Corvallis, Oreg. by the Division of Forage Crops and Diseases of this Department in cooperation with the State station; and at a point about six miles west of Cheyenne, Wyo.

The problems receiving consideration included varietal adaptability; effect of size of seed piece on plant development, yield and size of tubers; effect of depth of planting on yield and distribution of tubers, and of time of planting on yield and size; effect of spacing in the row and between rows on yield per plant and per acre and on size and number of tubers; the relation of time of cutting tops for silage to crude-fiber content of tops and to yield, size, and number of tubers; and eradication of volunteer plants. All plots except those relating to certain varietal studies were replicated at each place each year.

High yielding varieties tended to be so in all locations, but the order of superiority was not identical, indicating desirability for care in selecting a variety or stock for commercial culture. Analyses of levulose content of hundreds of stocks showed a disconcerting negative correlation between tuber-yielding capacity and levulose content, but the highest yielding variety in the tests showed also the highest 6-year mean percentage of levulose and total sugars, thus marking the search for high-yielding, high-analysis varieties as reasonable and of promise.

Increasing the size of seed pieces was consistently accompanied by increase in number of stalks per hill, regardless of location or season, though not accompanied by an increase in mean size of tubers harvested. Most of the studies showed very marked decreases in yield for every planting after the first, so planting as early as the soil can be properly worked in spring is to be recommended. The 4-inch planting depth gave best results generally; 6-inch in dry regions. The 12-inch spacing between hills gave higher yields though producing tubers of significantly lower mean weight than wider spacing. It seems very improbable that really satisfactory yields both of tops for forage and of tubers can be obtained from the same plants, so a given acreage or plot should be grown for but one purpose. If the crop is grown for its tubers, leave the tops undisturbed until they are killed by frost, says the bulletin.

Follow artichokes the next season with a late-sown, quick-growing hay crop or cultivated crop, it also advises. "Plow deeply and thoroughly when volunteer artichokes are a foot or more high. Hand-pull the survivors, unless they will be destroyed by harvesting the crop in which they are growing before August."

The bulletin is sold by the Superintendant of Documents, Government Printing Office, Washington, D.C. at 10 cents a copy, and appears certain to meet with unusually large demand.

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

"We finished planting the experimental plots Thursday, June 11," he writes for the week ending June 13th. "Because of the long-continued period of wet weather in May, we were nearly two weeks later than usual in starting the planting. Since the first of June ideal weather condition have prevailed and the soil has been in excellent condition for working.

"The planting of the commercial fields is practically completed. While no reliable data are available regarding the acreage planted in Aroostook County, it is believed that there has been no material change from that of last year."

P. M. Lombard, Presque Isle, Md.

He wrote June 6th that the bulk of the acreage in Aroostook County that is to be planted to potatoes was 90 percent complete, while grain was late, owing to the May rains.

"The potato market has steadily advanced for 10 days, some stock bringing as high as $7.00 a barrel, f.o.b., graded," he added.

THE RASPBERRY!

There is an old adage about "gathering fruit with the dew on it," says a Press Release of June 28th, but early morning temperature and not the moisture of the early morning dew, is the chief factor in the keeping quality of raspberries, our horticulturists point out.

"Tests at the Minnesota Experiment Station showed that red raspberries, picked from 7 to 9 in the morning, had 15 to 20 percent decay after 4 days. Berries picked from 10 a.m. to 1 p.m. had 65 to 95 percent decay. Even if the berries picked in the middle of the day were cooled, those picked early in the norming kept much better.

"Raspberries picked early in the norming warmed up a little during the day, but always were much cooler than berries picked later, in midday. In a well-ventilated shed they cooled to a temperature below that of the shed, through evaporation. When put in a cool cellar as soon as picked they cooled more slowly than in the well-ventilated shed or in the shade of a tree.

"Berries kept in a refrigerator at 45° to 48° F. for even 2 or 3 days, kept longer after being taken out than berries not put in the refrigerator at all. After 24 hours in the refrigerator, however, the longer the time they remained, the shorter the time they kept when taken out. A delay of 5 hours or more in putting berries into refrigeration greatly reduced the length of time they remained in marketable condition."

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"As mentioned in an earlier report, this season has been an unusual one from the standpoint of fruit growth," he writes under date of June 9th. "Apples, pears and cherries have developed more rapidly than during any season that I have experienced in the Northwest. Yellow Newtown apples, as well as other varieties, were as large 40 days from full bloom as they normally are 50 and 55 days from full bloom--this applying to trees with the same amount of fruit.

"Following two days of cloudy weather, May 31 and June 1, the Pacific Northwest experienced an unprecedented fall of rain on June 2 and 3. The rainfall in these two days was 2.9 inches. In addition to severe erosion, our crop of Bing and Royal Ann cherries was practically ruined. From 50 to 55 percent of the fruit of these varieties showed cracking at the blossom end. The Lamberts were not so far along in development, and although an occasional cracked cherry could be found, the crop will not be seriously reduced providing further rain is not experienced.

"Following these two days of rainfall, the sky remained cloudy and again on the night of the 6th and the afternoon of the 8th 1.4 inches of rain fell, bringing the total precipitation to about 4.3 inches for the week. This increased the percentage of cracking to approximately 60 to 75 percent of the fruit in the Wenatchee district proper. The percentage will not be as great in the higher districts of the Wenatchee River valley, Entiat and Methow valleys, although the damage will be so severe that the possibility of harvesting is doubtful. Unless the price of cherries exceeds all expectations, very few Bings or Royal Anns will be picked. Barring further difficulties, the Lamberts, as stated before, will be about normal.

"Reports from the Yakima district indicate that they have suffered to a similar degree, although the rains of the 6th and 8th apparently were more localized to the Wenatchee district, which may increase the percentage of cracked fruits in Wenatchee over that of Yakima. The degree of cracking varied from almost complete splitting of the cherry to the seed, to very small cracks and scald spots. The growers are complaining that the cherries are rotting on the trees. However, so far we have been unable to find any where rot organisms have entered, the darkening of the tissue being due probably to oxidation.

"The experience of this spring has settled once and for all the question often discussed among the growers as to whether sunshine is a factor in the cracking of cherries. At no time during this period has the sun shone but yet the cracking was extremely severe.

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley (continued)

"In checking on the extent of injury, we observed that both Bing and Royal Ann trees which were in a very vigorous condition and carrying heavy foliage, showed less cracking than trees with less foliage. This we attribute to the protection afforded the fruits in shedding the water. At no time did I observe any cracking at the stem end, all of it occurring at the blossom end where the drops of water remained. Had there been some wind with this rain, no doubt the losses would have been greatly curtailed."

John C. Dunegan, Fayetteville, Ark.

"The continued lack of rain in northwest Arkansas is beginning to assume a serious aspect," he writes on June 6th.

"The last rain of importance in Fayetteville occurred on May 12. The section is now entering the period of the year when dry weather is rather the normal thing, and figures show that in 1936 there has been a rainfall deficit of approximately 15 inches for the first five months. This lack of rainfall during the first five months makes the situation for the next few months during the 'normal drought' period unusually critical this year.

"On June 4 I attended the summer meeting of the Arkansas State Horticultural Society at Nashville, Ark., and discussed the control of fungus diseases in an informal address. After the meeting I examined a number of the more important commercial peach orchards in the district and found a slight trace of bacterial spot on the leaves but none on the fruit. The entire district is suffering from the lack of moisture and unless they get relief I believe their fruit will not size up very well this season. Many peaches are not developing normally and are exuding gum. These symptoms are associated with the freeze of April 1.

"The Nashville growers are beginning to plant early varieties such as Red Bird in the district and I am afraid that they are going to have more brown rot in future years. Red Bird trees that had a crop in 1935 suffered from blossom blight and fruit rot and as the additional plantings come into bearing this disease will become more of a factor."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Reporting on activities for the week ending June 13th, he writes: "The drop records scheduled for the week were completed. The blossom records were also completed at the station farm and on the trees in the experimental plots in the Albany Peach and Pecan Company orchard and the Palmyra Pecan Groves Company orchard.

An abnormally heavy drop of nuts on all varieties is noted at the present time. This drop is occurring about six weeks after pollination and is bearing out previous predictions which were based on abnormal conditions during the pollination period and on the very low percentage of pollen germination obtained in a laboratory study of this subject. The exact cause or causes for this drop cannot be determined exactly but it is no doubt due to lack of fertilization of the ovule as a result of injury to the pollen by low temperatures....

"Temperatures during the week were about normal. Local thundershowers occurred over most of the Southeast. We were fortunate to receive about 2.5 inches of rain at Philema, and as a result all cover crops and all trees are looking much better."

C. L. Smith, Austin, Texas

"About 4 inches of rain fell during the latter part of May," he writes. "At Austin, work on experimental data and analytical work was done during the week ending June 6th. The nut case-bearer in some orchards, where a fairly heavy crop of nuts was set, are taking a very heavy toll. In some cases 25 percent or more of the nuts have already been destroyed by this insect. Reports from Crystal Springs indicate that there is a heavier infestation there than at Austin."

Writing on June 13th he says: "At Brownwood the check of cover crop yields in the plots was completed; cluster counts in the dropping experiment made; and trees sprayed for rosette. A rain of 1.61 inches fell on June 12 and 13. At Austin, cluster counts in the dropping experiments were also made, the grafts of cross-bred seedlings checked and necessary forcing done. Three small orchards near San Antonio, where pecan trees are rosetting badly, were discovered on a detour of the highway and the owner advised to spray them. At Bexar County Farm the trees treated with soil applications of zinc sulphate in the early spring of 1934 are not showing any improvement at all yet. In trees treated by salt insertion into the trunk there is now no noticeable effect of treatments made in 1934."

BUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The forepart of the week ending June 13 was spent in the field taking results of prune russet studies," he writes from the U. S. Fruit Disease Field Laboratory on June 13th.

"Results of this year's studies on the cause of russet are at variance in certain respects with the results of last year's investigations. A number of the prunes in our celluloid cages which were subjected to the work of thrips contain small russeted areas located mostly at the apical end. However, in only a very small percentage of the fruit so affected are the areas of sufficient size to cause the fruit to be rejected from the top grade. In fact, the areas involved will not be detectable after the fruit has been dried.

"On the other hand, the fruits which were experimentally rubbed shortly after shuck fall with stems of twigs are badly russeted, the affected areas covering, in most cases, from 1/4 to 1/2 of the total area of the fruit.

It would seem, therefore, that under certain conditions thrips may cause small russeted areas on the fruit. However, both observational and experimental evidence would appear to indicate that russeted areas caused by thrips are not of sufficient size to result in economic loss in the majority of cases. Mechanical injury due to the rubbing of the fruit against stems of twigs and sharp edges of leaves, on the other hand, appeared to be the principal cause of the type of russet which results in economic loss.

"In further russet studies made during the week a significant difference was found in the amount of badly russeted prunes inside and outside of windbreaks. Thus, in an Italian prune orchard near Amity, Oreg. only about 2 percent of the prunes inside a 'boxed' tree were badly russeted, whereas approximately 13 percent of the prunes on trees outside the windbreak were badly affected.

"The latter part of the week was spent largely in taking final results of greenhouse studies carried on during the past winter and spring. Among other things the results of these studies show (1) that walnut buds in the dormant stage are not susceptible to blight infection, (2) that the nuts are susceptible to infection by *Phytomonas juglandis* just as soon as they are exposed on the new growth, and (3) that as little as 10 minutes of wetting after inoculation is sufficient to cause infection of nuts in the prebloom and full bloom stages of development, respectively."

FLOWERS

The Division has been ever mindful of the importance of linking the ornamental with the useful, and so work on fruits and vegetables has always been interpreted to cover investigations of flowers and ornamentals, the improvement of the appearance of the farm landscape, and so on. It has gone even farther and in the case of the bulbs, at least, proved that the ornamental can be profitable as well. A somewhat new and interesting phase of the matter is brought out, however, in one of our recent press releases.

"Many plant flower beds for color and decorative masses, kitchen gardens for utility, herb gardens for savor, but only a few plant for perfume in the garden or in cut flowers," the boys in the Press Service point out in a release given wide distribution.

"Women of Martha Washington's time knew how to save the delicate scent of rose petals by putting them in jars with salt, or they made a potpourri of different flowers. They gathered damask, roses, and lavender and dried them to make linen drawers sweet, or used violet water. They liked the scent of lilies-of-the-valley and lilacs.

"It is possible to plant shrubs and vines and flowering annuals and perennials to add to the fragrance of the garden--roses, English violets, carnations, and little clove pinks, and some of the fragrant peonies for indoor vases. There are so many fragrant annuals and perennials for the home garden that a choice depends on preference and climate.

"The perfume garden is so planned that one group of plantings is succeeded by another, each with its own appeal, such as sweet alyssum. mignonette, pinks, perennial phlox, sweet heliotrope, stock and some of the nicotianas. Nasturtiums have a spicy fragrance. The leaves of rose geranium are both fragrant and spicy and may scent a fingerbowl or flavor a mild jelly.

"Many shrubs are delightfully fragrant--the reddish velvety 'sweet shrub' or Calycanthus; lemon verbena; lilac; and mockorange, called Philadelphus or syringa in the North, Carolina cherry in the South; the butterflybush (erroneously called 'summer lilac') from China, whose long drooping rich violet blooms give off deep fragrance all summer. The sweet-scented summer-blooming honeysuckle vine of the South is the naturalized Japanese honeysucke, Lonicera japonica, ranging from Pennsylvania, Ohio, and Missouri south; the beautiful and fragrant Chinese and Japanese wisteria, and various sweet species of clematis."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASES INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

"The Brogdex Company has installed a brush washing machine, adapted from an orange washer at the American Fruit Growers' Ninth Street plant and with a single process sodium silicate solution at 90° to 93°F. are satisfactorily cleaning a 1935 Winesap crop that could not be cleaned to meet the lead tolerance in double process machines with temperatures as high as 120°F.

"The fruit is passed along by and over oscillating brushes underneath overhead revolving brushes for 1-1/2 minutes, being under a spray solution for 45 seconds, before passing into the old American Fruit Growers' machines that are used for rinsing. Considerable storage scald has developed in these unwrapped Winesap apples.

"Following rather warm weather during the last week in May, unsettled weather prevailed on the 31st, being cooler and cloudy on June 1. At about 11 a.m. June 2, a 24-hour rain set in which was followed by unsettled weather with an extremely heavy rain during the night of June 2, lasting during the following forenoon. During the period 4.4 inches of rain fell. Although cherries were scarcely more than half-grown they cracked, some as high as 80 or 90 percent. Many crops of Bings are over 50 percent cracked; some as high as 80 or 90 percent. Where 50 percent cracked, it is doubtful if it will pay to pick and sort them."

OUTSIDE PUBLICATIONS

There is a standard form for use in requesting permission for outside publication of papers (including attendance and presentation of papers at meetings), first distributed with Mr. Gilbert's memorandum for section leaders on February 9, 1935. This form (a first heavy sheet, and thin green and white second sheets) may be secured through our Supply Section.

The form should contain the name of the division (in upper left hand corner) and date submitted. Below the "Title" add a line for "Author", giving his official title. If Form 61 is not to be submitted, xxxxxxx out that line. Five copies of the form are needed--the original (which is returned to the author when paper is approved), a thin white form for the file of the Chief of Bureau, one for the Library, a thin green carbon copy, and a copy on thin plain paper for Mr. Gilbert's files, to be attached to his carbon copy of the manuscript. Remember, also, that TWO carbons of the manuscript are now to be sent along with the original--one for the Office of Information, the other for Mr. Gilbert.

DEEP CULTIVATION

"Observations made at Rothamsted and described by Dr. Crowther indicate that the subsoil may become an important reservoir of soluble nitrogen (nitrates)," says an editorial in the Gardeners' Chronicle (London) for May 30, quoted in our Daily Digest.

"Washed down by autumn rains from the surface layer the nitrates may be retained by the deeper layers and made available for the roots of plants; although, needless to state, where the soil and subsoil are both sandy, little or no nitrate will be retained either in the surface or subsoil. Rain will wash it out of range of the roots, a fact illustrated in this May on every sandy common in the south of England. There, long after the season of growth has begun, the grass covering of the common is still without sign of growth; a wet autumn and winter, a dry spring, no warmth, no nitrogen--no growth.

"Other observations made by Dr. Crowther on the responses of the potato and beet to manuring with potassic fertilisers prompt us to ask whether we know yet what are and may be the relative contributions of the soil and subsoil to crop production. The potato, a shallow rooting crop, grown in heavy land at Rothamsted responds to a dressing of potash; but when grown on the light sands at Woburn it does not. On the other hand, sugar beet, a deeper rooting crop, sometimes responds to potash at Woburn but never so far at Rothamsted. Even more important, however, than the part played by the subsoil in the provision of plant nutrients is the question of water supply. It is in this respect, at all events in our opinion, that the deep cultivation advocated by all good gardeners receives its justification...."

REVIEWING MANUSCRIPTS

Occasionally manuscripts prepared in other Bureaus or Offices of the Department are sent to members of our staff for reading and comment. The Office of the Chief of Bureau of Plant Industry informs us that in future comments and criticisms on such manuscripts are to be submitted in TRIPLICATE. This means that we shall need an original and THREE carbon copies; the original and two carbon copies to go to the Chief of Bureau with the returned manuscript, and one carbon copy to be retained in Mr. Gilbert's files.

DEATH OF MRS. A. C. HILDRETH

Members of our staff will be saddened to learn of the sudden death on June 9, 1936, of the wife of Dr. A. C. Hildreth, superintendent of the Horticultural Field Station at Cheyenne, Wyo. The funeral was held the afternoon of June 11th, with interment at Lakeview cemetery, Cheyenne. Messrs. Powers, Benedict, Kraus, Hastings, Kelso and Roney acted as pallbearers. The floral tributes were many and beautiful, the Hildreths having won many firm friends during their residence at the Cheyenne station.

Vol. 8 No. 13 July 1, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY NEWS LETTER.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

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Vol. VIII Washington, D.C., July 15, 1936 No. 14

Drought Spreading

Since the News Letter is prepared some two weeks before you see it, here's hoping conditions may be much better when it reaches you, but just now the drought situation is giving rise to plenty of worry. Weather Bureau rainfall figures for April, May and June tally almost exactly with those of the disastrous 1934 drought period. The Secretary on June 27, named a committee to assist in drought relief—Jesse W. Tapp, Assistant Administrator of the Agricultural Adjustment Administration (Chairman); C. W. Warburton, Director, Agricultural Extension Service; Hugh H. Bennett, Chief, Soil Conservation Service; A. G. Black, Chief, Bureau of Agricultural Economics; and W. F. Callander, Assistant Administrator, Agricultural Adjustment Administration. Joseph L. Dailey, Assistant Administrator of the Resettlement Administration, will also serve as a member.

"The present drought situation," said Secretary Wallace in naming the Committee," is sufficiently serious to warrant the setting up of a committee to consider all matters relating to the drought, to coordinate drought activities of various agencies and to formulate recommendations and plans to meet distressing conditions which may result from continuance of drought in certain regions.

Translated into consumers language, continued lack of rain in the Corn Belt, for example, will mean scarcity of feed for livestock and so reduce meat supplies. Too, grain trade reports claim that only soaking rains can now stop the deterioration of crops—and no rains were in sight. Although the Dakotas and their neighbor States suffer the worst privations, the drought covers many States.

While the drought is too broad a subject to fall within the field of an informal publication such as the NEWS LETTER, it is commented on because it offers a tangible evidence of the service which our Department supplies in time of need. A number of steps already have been taken to ease the effect of abnormally light rainfall and high temperature, particularly in four northwestern States, a Department news release points out. The States most seriously affected right now seem to be North and South Dakota, Montana and Wyoming.

"Clearance has been obtained from the Interstate Commerce Commission enabling railroads in this territory to reduce freight rates on shipments of livestock out to good pastures and eventually back again. Rates of 85 percent for outgoing shipments and 15 percent for return shipments have been allowed. The Northern Pacific Railroad already has granted this reduction.

"Requests for reduced freight rates were made by railroad commissions, State governors, livestock producer organizations, and other organized groups on behalf of producers. In support of these requests, Secretary Wallace has assured the major railroads in the drought territory that the Department of Agriculture would cooperate in seeing that livestock shipments so allowed originated on drought-affected farms. Farmers in a position to take advantage of the reduced rates will thus be able to maintain their foundation herds.

"It also was announced by Secretary Wallace that 8,000 to 10,000 tons of mill feed had been made available to the Federal Surplus Commodities Corporation for distribution in western North Dakota, western South Dakota, eastern Montana, and northeastern Wyoming. The Federal Surplus Commodities Corporation is making arrangements for turning this feed over to State relief agencies for distribution to farmers for the feeding of livestock.

"This mill feed is a byproduct from the milling of flour for relief use from wheat purchased by the Government in the Pacific Northwestern States with funds made available to the Secretary of Agriculture under section 32 of the amendments to the Agricultural Adjustment Act approved last August. The feed, now located at milling points west of the Mississippi River and from Kansas City north, will be shipped immediately into the four drought-affected States."

Nothing bolsters up morale like victory, it has been said, and the prompt response of our Department in emergencies—its ability as well as its readiness to serve--must surely arouse in every thinking employee a feeling of pride in the organization, and a keen realization that ours <u>is</u> something more than a job—an opportunity for service.

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

Writing from the Coastal Plain Station on June 27th, he says: "On June 23 I visited the berry market at Rose Hill. The wild huckleberries were selling for about $4.50 to $5.00 per 32-quart crate. Dewberries are selling for about $2.50 per crate. I also visited the blueberry orchard of B. C. Crabbe, Magnolia, N. C. They have finished picking some of the earlier varieties but will have three or four more pickings on the later varieties, such as Pioneer, Rubel and Jersey. The Jersey appeared to be about the best variety there, but a serious disadvantage is its lateness; it is very productive and has very large attractive fruit....

"Last week I also visited a 5-acre Lucretia dewberry planting belonging to W. S. Wells at Rose Hill, N.C. He had picked 80 crates per acre, but there appeared to be enough dead dried up fruit on the vines to make 150 crates per acre, if it had matured. Many of the fruiting canes have died prematurely. He dusted heavily for weevil with the regular calcium arsenate-sulphur strawberry weevil dust and many of the leaves showed a burned or scorched appearance at the margin. Many of these leaves had dropped off; he is wondering whether the dust caused this injury."

He had written earlier: "Indications are that the 1937 season will find growers of the Wallace, Rose Hill and Mount Olive sections using the 24-quart crate exclusively as the standard container. That was the decision of a joint meeting of committees from the various sections appointed to investigate the question of reducing the size of the container. The Chadbourne section has used the 24-quart crate during the past season to the satisfaction of all concerned. It was decided to use the 32-quart crates on hand now for shipping blueberries and early strawberries next season.

"The blueberry season is on now in full swing in this section. For the past two weeks (June 8-22) Rose Hill has been flooded with berries, the price ranging from $6.00 to $7.00 per crate. An average of 500 crates a day has been sold. The 'Rose Hill Blues' are specially packed berries in cellophane-wrapped baskets. They are also busy harvesting blueberries in the orchard planting of G. H. Huntington near Atkinson. His estimated yield for 1936 is about 4,000 16-quart crates. The wholesale price of the first grade fruit is 60 cents a quart, while the second grade brings 50 cents to the producer.

"The Rose Hill dealers also handled about 1,000 crates of dewberries per day for the two weeks, at an average of $2.50 per crate."

DECIDUOUS FRUIT INVESTIGATIONS

M. A. Smith, Springfield, Mo.

Writing from the Ozark Fruit Disease Laboratory on June 13th he states that the problem of soil moisture in his district at that time was becoming quite serious. Only 2.37 inches of rain fell during April, with approximately the same amount for May, so that on June 1 there was an accumulated deficiency of 11.25 inches for 1936.

"In May, 1934, just before the severest drought of record had begun in this district," he comments, "there was a deficit of 5.81 inches of rain but there was enough reserve moisture in the subsoil to carry fruit trees through the worst period of the drought. At the present time subsoil moisture is almost depleted. Many borings have shown that the soil in some orchards is dry at a depth of six feet. Unless we receive timely rains for the balance of the summer it is very likely that fruit crops—particularly apples--will be seriously damaged."

H. F. Bergman, East Wareham, Mass.

"The work of bagging cranberry flowers for cross pollination has been under way this week when time from dusting or spraying and weather conditions permitted," he writes for the week ending June 27th. "Flowers of several varieties have been bagged and some of them are ready for pollination.

"During the week ending June 13th determinations were made of the oxygen content of water on a bog which was being reflowed for insect control. The oxygen content during the day was sufficiently high so that no injury was anticipated for the length of time that the bog was being flooded. This week, however, on examining the bog, it was found that a considerable amount of bud injury had been caused by the flooding even for a 24-hour period. Where the bog was under water injury was greater, in some places being estimated as high as 30 percent. About 75-100 uprights were tagged to see if any of the injured buds open and set fruit.

"Analyses of spray residues for copper on leaves from plots which were sprayed some two weeks ago are being made as time from more urgent work permits. Leaf measurements are also being made so that the copper distribution can be calculated on an areal basis. Differences are evident in the total amount of copper present and in the uniformity of its distribution depending upon the kind of spray and sticker used. These data are being filed for checking against rot control next fall. Further measurements on the amount and distribution of copper in spray residues will be made during the season...."

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

"One of our purposes in the grape breeding work is the production of earlier ripening seedless varieties," he comments in his report for the June 15-27 period. "Preliminary records taken during the past week indicate that some of our seedlings are much earlier than the standard commercial varieties. Two tested 17.2 and 15.0 percent sugar content, respectively, while the Sultanina (Thompson seedless) tested 5.6 percent on the same date at the Fresno vineyard....

"Grape seedling buds inserted in growing shoots the latter part of May are making rapid growth. Some small buds taken from this year's seedlings which germinated after February 1 have made over 18 inches of growth at this time (May 24th). Dormant buds held in cold storage have also been used in this work and were found to unite with the new growing shoots. Buds taken from growing shoots of older seedlings and budded into vigorous stock shoots have produced fruit clusters, showing some fruit differentiation must have taken place in these grape buds on this year's growing shoots early in May."

Henry F. Bain, Wisconsin Rapids, Wis.

Writing from the Cranberry Laboratory on June 28th, he says: "Despite the fact that there has been a cool spring with particularly cold nights, cranberries have come into bloom ahead of the normal time. The bloom is so far advanced that it has been necessary to put in extra hours including Saturday and Sunday deantherizing flowers to be used in the cross pollinations. The variety selections at the nursery which have been assembled to use in this work stood the winter with only a moderate amount of water injury, and are in condition to promise good results from the crosses. The State men report that the crop condition in general is equal to its corresponding condition at this time last year. Present prospects are for a crop almost equal to last season's above-average crop."

George F. Waldo, Corvallis, Oreg.

"During the week a large number of raspberry selections were made," he writes for the June 22 to 27 period.

"The red raspberry seedlings were especially fine this year. The crosses are mainly Cuthbert x Lloyd George, Chief x Lloyd George, Newburgh x Lloyd George, Ranero x Lloyd George, and Viking x Lloyd George. So far this season about 50 new selections of red raspberries have been made. These selections are immediately tested for their canning and freezing qualities by the Food Products Industries, under the direction of Professor Wiegand."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Small Fruits (Dr. L. A. Fletcher)

"A rather close check in the vineyard showed several varieties which were beginning to ripen," says the report for June 27th. "These are Lutie, Champion, Hartford, Beta, and Manito. The Champion shows many bunches which are very nearly ripe."

He had reported previously that in checking over the pollination work in the Muscadine varieties it was noticed that an extremely good set had resulted from the use of Manito pollen.

Nut Investigations (A. C. Gossard)

"The entire week ending June 20th was spent making observations and taking notes on the chemical test plots in the pecan orchard. The notes consisted of descriptions of all 1200 trees in the experiment, to form the basis for recording changes observed as the experiment progresses, and of recording foliage condition, diseases, etc. on all trees.

"The week was very hot and dry with no rain. A temperature of 101°F., the highest ever recorded this early in June, was taken at the Meridian weather bureau June 18th."

"In going through the orchard during the spraying, a severe burning was seen on the trees in one of the plots which had received copper sulphate," says the report of June 6th."Five pounds of copper sulphate, as snowform bluestone, was broadcast like a fertilizer on May 6th around the base of 80 trees--8 plots of 10 trees each placed at random through a modified Latin square. This plot on which the burning occurred is located in an elevated basin near the southwest corner of the orchard. The soil is good Orangeburg loam. No burning was seen in any of the other copper sulphate plots nor in any of the plots which received other chemicals. The effect produced was that of a complete burning of the leaves in a considerable definite portion of the tree, such as an entire side or the whole inside of the small tree."

Vegetable Crops (Geo. P. Hoffman)

"The white potato blocks were harvested the latter half of the week ending June 20th. The yield on this planting - 7 selections replicated 7 times each in two blocks, a Latin and Modified Latin square - was such as I have never before seen in this section. The quality was excellent and the yield averaged well around 80 barrels of ungraded potatoes per acre with the percentage of U. S. 1s being 75 to 85. Our poorest quality was observed in the Golden which showed much second growth and 'knob-like' growth. The Katahdin and Chippewa gave remarkable yields and quality with tubers weighing as much as 20 ounces. Just at this time it is hard to say which of these two varieties will have first place."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASES INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

According to a story that comes to us from Wenatchee, a farm worker came into town to apply for a job at a factory. "I think we can find a job for you," he was told by the foreman, "but you'll have to work in a night shift." The applicant shook his head in discouragement. "That's too bad," he said. "I have only pajamas."

The story does not say what sort of factory it was, but it seems quite likely it must be a new one for turning out the apple juicer Ed Smith tells about in his report of June 24th. "The Yakima Fruit Growers, Hood River Apple Growers Association, Wenoka Federation, and Skookum Packers Association are now coordinating their efforts under a super organization known as the Pacific Northwest Fruits, Inc., with Mr. James Klahre, formerly local manager for the Atlantic Commission Company, as manager, with his office in Yakima," he writes. "This organization is commonly referred to as the PNF.

Apple Juicer

"Mr. Klahre this week demonstrated in Wenatchee a new soda water fountain apple juicer somewhat the same in outward appearance as the Sunkist orange juicer. By means of a high speed shredder and grater the pulp goes into a rolator press which with high speed centrifugal action throws out the juice. It apparently extracts quite a high percentage of the juice as a large Winesap apple would throw out nearly a glass full. The product is cloudy, or opaque in color, being influenced by the color of the apple, and is not as attractive to look at as some of the filtered juices. However, it is somewhat of a creamy consistency and having a high percentage of solid matter retains the characteristic varietal flavor which is quite different from any apple juice we have ever tasted."

Of course, as this juicer gets around and makes apple juice readily available, it may be well to remember the philosophical observation that apple juice is like a good many other things in this world--all right if you do not take it too hard.

"We were in Seattle and Sumner June 17-19th," Ed continues, the apple juice apparently having taken no effect on him. "The pea crop will not be frozen at Monroe much before July 10th. Market conditions for frozen peas do not indicate much shipping before August 1. The raspberry crop in the Pytallup valley is now being harvested and arrangements were made to secure some berries to be forwarded to Yakima for studies on moisture condensation and subsequent mold growth when cooled to various degrees and then held at higher (refrigerator car) temperatures. Studies will be made shortly after July 1."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Results of this year's studies on walnut blight control furnish further proof that timely spraying with bordeaux mixture will reduce the incidence of blight to an insignificant amount," he writes in his report for the week ending June 27th. "Thus, in spraying tests carried on in a Franquette orchard near Scholls, Oreg. the incidence of blight infection on the nuts was reduced from about 56 percent to 5.5 percent by two treatments of bordeaux mixture 2-2-50 applied just before and immediately after bloom. Even better control followed the application of three treatments of bordeaux mixture applied in (1) the early prebloom stage, (2) the late prebloom stage, and (3) the post bloom stage of development, respectively. In this plot only 2.6 percent of the nuts examined were found infected.

"The latter part of the week was spent in taking results of spraying tests for the control of the bacterial blight disease of filberts. Results of this year's investigations on the control of this disease by spraying furnish further proof that timely applications of bordeaux mixture will materially reduce the number of blight infections. Thus, in a test carried on in a 5-year-old Barcelona filbert orchard located near Woodburn, Oreg. 86 percent of the trees in the untreated plot were moderately to severely infected, whereas in the plot sprayed with one fall and two spring treatments of bordeaux mixture 4-4-50 only 13 percent of the trees were moderately infected and there were no severely diseased trees in the plot."

"One day during the latter part of the week ending June 20th was spent in the field with C. E. Schuster in survey work in a young filbert orchard near Peoria, Oreg. which was reported to be dying from some undetermined cause," he had written earlier. "Upon examination it was found that cankers were present in the bark of the trunks beneath tree trunk protectors which extended up to about one foot above the ground line. In some cases the basal part of the tree beneath the soil level was also affected. The exposed part of the trunk above the protectors was uninjured. Upon closer examination it was noted that the injured areas were confined to the outer bark and that new callus tissue was forming underneath the affected areas and that the old dead outer back was beginning to 'sluff' off. The trouble was tentatively diagnosed as 'scorch' due to a building up of extremely high temperatures in the top layer of the soil and within the confines the protectors during the extremely hot periods which occurred in Oregon last summer. This orchard is located on a sandy river bottom soil which would tend to accentuate the condition. This is the first time that seemingly deleterious results have been noted from the use of tree trunk protectors on filberts."

ADMINISTRATIVE NOTES

Automobile Operation — The revised Regulations of the Department, effective July 1, 1936, provide that an employee of the Department may operate a departmental motor vehicle only when there has been issued to him by the Department of Agriculture a motor vehicle operator's permit. Only an employee who has qualified by an examination given by a responsible supervisory administrative officer designated by the chief of bureau or who possesses a State motor vehicle operator's permit granted after an examination shall be granted a permit to operate a departmental motor vehicle. All District of Columbia drivers of the Department's motor vehicles shall, of course, have a District of Columbia operator's permit.

If you have occasion to operate a Department car and have not yet received one of these new Department license cards, please make application to the Business Office at once for one. The cards are numbered serially and must be turned in when an employee leaves the service. They are, of course, good only for the operation of a Government-owned motor vehicle used on official business and even then the employee is personally liable for personal injuries as the Department cannot, under the law, pay damages for personal injuries.

It is expected that those having supervision over employees who have occasion to drive Government cars will see that such employees carry liability insurance. And, of course, an employee is also expected to comply with the State and local requirements in the matter of driving permits before being permitted to operate a vehicle on Government business.

It is our understanding that these new Department license cards are not necessary in connection with the operation of vehicles on field stations, but are required for the operation of all motor vehicles on public highways.

Bids — Changes are continually being made in the wording of clauses that must be included in specifications for bids on supplies and equipment. It is thus very desirable that all such specifications be submitted to the Washington office before being sent out, if time permits.

We have just been advised that the following paragraph must now be incorporated in all specifications for bids:

> "Telegraphic bids will not be considered, but modifications by telegraph of bids already submitted will be considered if received prior to the hour set for opening."

ADMINISTRATIVE NOTES

Approval before Purchasing. Paragraph 3348 of the revised Regulations of the Department, approved by the Secretary on April 23, 1936, to become effective July 1, 1936, reads in part:

> "Automotive equipment, computing, bookkeeping and other accounting machines, duplicating and other reproduction equipment, motion picture camera and projection machines, sound recording and other motion picture equipment, and noiseless typewriters, irrespective of cost, shall not be purchased without the prior approval of the chief of the division of purchase, sales, and traffic who will first refer such requests to the proper departmental authority for clearance."

This restriction has been included in the Regulations for legal as well as administrative reasons, says a memorandum from Mr. W. A. Jump, Director of Finance for the Department, dated June 20, 1936. Noiseless typewriters, for example, may only be purchased after approval by the Secretary. The purchase and use of printing and other duplicating equipment is carefully restricted by law. This provision, incidently, is not restricted to purchases from regular appropriations nor to equipment for offices in Washington, D.C., but applies to all funds available in the Department and to all offices both field and Washington, D.C. All exemptions from former regulations concerning purchases of these items are thus canceled by the Secretary's approval of this Regulation.

Aerial Photographs In order to avoid duplication of the work of other agencies in connection with aerial photography, it is essential that all requests for such work be sent to Dr. Auchter for approval before any work is done. Under Office of the Secretary Memo. 697, dated June 18, 1936, all proposed projects involving aerial photography must have the advance approval of the Land Policy Committee, specifications must conform to those endorsed by that Committee, and meet the requirements of the Department's Office of Budget and Finance.

Upon receipt of application for such work, Dr. Auchter will pass on its desirability and, if he approves, the application will go through the usual channels to the Land Policy Committee which will find whether there are already available surveys for the area involved, or whether work within or in the vicinity of the area is contemplated. If it is found that the work will not duplicate that already done, that the photographs will be adequate, and the work in full conformity with the approved specifications, the Land Policy Committee will approve the application and authorize the beginning of the work. But no such work should be undertaken without this definite, in advance, approval.

ADMINISTRATIVE NOTES

Lubricating Oils, etc. A circular letter from the Procurement Division of the U. S. Treasury Department advises us that the procedure existing during the fiscal year just closed regarding the procurement of lubricating oils will be continued. It is, therefore, directed that all Federal activities obtain their fiscal year 1937 lubricating oil requirements under the Navy Department contracts, excepting oils for aviation use and oils for such special use as activities have been and may be authorized to procure independent of the Navy contracts. The contracts will cover various grades of lubricating oil considered sufficient to satisfy the normal requirements of all Federal activities. In the event, however, that none of the lubricating oils covered by the Navy contracts will satisfy a special requirement of an activity a request to purchase special oil or oils will be addressed to the Director of Procurement, stating in detail the necessity therefor.

A great deal of the difficulty experienced in the past with lubricating oil obtained by Federal activities under the Navy Department contracts has been due to the use of oil too light in viscosity for the kind of service expected of it, this being particularly true where internal combustion engine equipment is involved. The information presented herein regarding the selection of lubricating oils under the Navy contracts is furnished for the guidance of all concerned.

The manufacturers' recommendations are based upon new car condition which may be generally taken to mean less than 10,000 to 15,000 miles of proper operation. After this mileage it is generally desirable to use an oil one number higher in the classification if the cylinders and piston rings have not been overhauled. For example, if the recommendation requires a S.A.E. 20 (Navy Symbols 3050 or 2135) for a given condition, after 15,000 miles a S.A.E. 30 (Symbols 3065 or 2190) should be used.

Recommendations for the use of a given oil for a given service condition made by the Bureau of Engineering, Navy Department, in its pamphlet - Lubricating Oil, General Information, Requirements and Methods of Test - are the consensus of opinion obtained from a number of sources. They, like recommendations of producers of apparatus, are based upon conditions of the apparatus when new or in good condition.

In some cases, makers of apparatus recommend lubricating oil by brand name of an individual producer without any reference to S.A.E. numbers, viscosity or other means of identifying a suitable substitute under the Navy Department contracts. In all such cases, send a 1-quart sample of the recommended oil to the U.S. Naval Engineering Experiment Station, Annapolis, Maryland, and a suitable oil under the Navy Department contracts will be recommended. A clean metal container should be used.

The symbols used to identify the Navy oils have four digits; the first digit indicates the class and the last three digits the viscosity at the following temperatures: Viscosity at 130 deg. F. is used for Class 2 and Class 8 oils; Viscosity at 210 deg. F. is used for Classes 1, 3, 4, 5, 6, and 7 oils. In the following tabulation, column 1 gives the symbol designation, columns 2 and 3 the viscosity ranges, column 4 the approximate viscosity-index, column 5 and corresponding S.A.E. number for crankcase use and column 6 the corresponding S.A.E. number for transmission and differential use.

1	2	3	4	5	6
Symbol	Viscosity, S.U.V.		Viscosity-Index (Dean and Davis), minimum	Corresponding S.A.E. Number	
	At 130°F.	At 210°F.		Crankcase	Transmission
1080	.....	75-90	95	40	80
1100	.....	90-105	95	50	90
1120	.....	115-125	95	60	90
1150	.....	140-160	95	70	90
2075	70-90	.....	.....	10W	.....
2110	90-120	.....	.....	20W	.....
2135	120-145	.....	.....	20	.....
2190	185-205	.....	.....	30	.....
2250	245-280	.....	.....	40	.....
3050	.....	45-55	75	20W	.....
3065	.....	60-70	75	30	.....
3080	.....	75-90	75	40	80
3100	.....	90-105	75	50	90
3120	.....	115-125	75	60	90
4065	.....	65-75	.....	.....	.....
5065	.....	65-75	.....	.....	.....
5150	.....	135-165	.....	.....	110
6135	.....	120-150	.....	.....	.....
7105	.....	95-110	.....	.....	.....
8190	180-200	.....	.....	.....	.....

The Navy Department classification of oils under contracts 48915, 48996, 49069, 49070 and 49071 as outlined in Contract Bulletin L4/JJ-14(6) (SPG) issued by the Bureau of Supplies and Accounts, Navy Department, June 15, 1936 is so designed as to provide an oil of the proper viscosity for general service from the lightest to the heaviest in the following order: Symbol 2075; 2110, 3050, 2135, 2190, 3065, 2250, 3080, 1080, 3100, 1100, 3120, 1120 and 1150. Copies of the Contract Bulletin may be obtained through our Business Office.

ADMINISTRATIVE NOTES

It should be noted that the following changes have been made in the symbol numbers, the requirements remaining the same:

1075	changed	to	2075
3080A	"	"	1080
3100A	"	"	1100
3120A	"	"	1120
3150	"	"	1150

When it is apparent that the oil recommended is too light, a heavier oil should be substituted. High consumption of oil is probably the best indication that the oil is too light. The fact that an oil appears to have a "thin body" when operating under temperature is not necessarily an indication because all oils become thinner as they warm up.

On the other hand, if the oil is too heavy a lighter oil should be substituted. Excessive oil pressure and excessive gasoline consumption indicate that the oil is too heavy.

When an oil appears to be giving unsatisfactory service, this fact should be reported and samples should be sent direct to the Engineering Experiment Station, Annapolis, Maryland, each in a 1-quart metal container. The following samples and data should be furnished:

(a) One quart sample of new lubricating oil.
(b) One quart sample of used lubricating oil taken from the crankcase of the engine after failure and after thorough mixing of the oil to obtain a representative sample.
(c) One quart sample of the fuel in use at the time of failure.
(d) Name of engine manufacturer.
(e) Type of engine, two or four cycle, gasoline or Diesel.
(f) Size of engine, cylinder bore or stroke.
(g) Nature of power service for which engine is used (dredging, electrical power, generation, automotive, etc.)
(h) What part of the engine failed.
(i) Such other data as may be helpful in diagnosing the trouble.

While paragraph above is applicable primarily to automotive equipment it can be followed or modified for any other apparatus.

The Navy Department contracts require specifically that samples of oil must be sent to the U. S. Naval Engineering Experiment Station, Annapolis, Maryland. By inadvertence some Government Activities have sent samples in the past to other Government laboratories, which has resulted in confusion and inability of the forwarding activities to obtain promptly constructive information.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

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Harvesting Grapefruit in Florida

According to the newspapers, Congresswoman Kahn of California took her mother for a visit to Leland Stanford University. Talking to Dr. Moses of the University, the mother inquired if he was a Jew. "No, I'm a Welshman," he replied. "I'm from Wales. We never heard of a Jew in Wales." "Really?" was the retort. "How about Jonah?"

The Doctor had not gone back far enough into history, that was all. J. R. Winston, in Circular 396, "A Method of Harvesting Grapefruit to Retard Stem-End Rot," says that's the trouble with the younger horticulturists who regard pulling grapefruit instead of clipping as a wide departure from crop-tested and time-approved procedure. He points out that before specially constructed fruit clippers became generally used, it was a common practice to pull citrus fruits.. So he modestly insists that his method of pulling grapefruit instead of clipping is not a new one but merely the revival of an ancient practice.

The investigations reported on show that in Florida pulled grapefruit, except when very ripe, is less rapidly affected by stem-end rot than is clipped grapefruit. Even when the fruit is very ripe, there is no more decay than from clipped fruit. Pulling is especially recommended for fruit intended for storage or for the export trade. Tangerines tear too easily to be pulled, oranges can be successfully pulled only when the fruit is fully ripe, but it has been shown that grapefruit can be pulled at almost any time during the normal marketing period with little injury to the rind or no more than usually occurs when the fruit is clipped. And, of course, pulling grapefruit is cheaper than clipping.

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

"After three warm days (June 29 - July 1) with temperature maxima between 90 and 95°F., the weather became a little cooler each day," he writes from the U. S. Pear Field Station on July 13th. "On July 8-9-10 this Valley had its heaviest July rainfall since 1916, with a precipitation of .50 inches. With the very low evaporating power of the air accompanying this rainy period, the rate of Anjou fruit enlargement became as great as 2.3 cc per day per fruit. This rate of enlargement is about twice as great as usually occurs at this stage in the fruit development.

"In 'dry' plots during this rainy period fruit enlargement, which had previously been less than in 'wet' plots, became as great or nearly as great as in 'wet' plots. I interpret this as a substantiation of our contention that the reduced fruit enlargement in 'dry' plots with average soil moisture still well above the wilting percentage is largely due to transpiration losses exceeding water intake by the roots. Thus, during this rainy period with low evaporating power of the air, transpiration was reduced to a rate which did not exceed the rate of water intake by the roots....

"Using Dr. Magness' idea that there is a relatively constant period between full bloom and optimum picking maturity for apples or pears in any given locality, we have estimated that period to be 130 days for Bartlett on heavy soils in this district. Mr. C. B. Cordy, assistant county agent, is now using this information in answering queries by growers as to the probable week during which Bartlett harvest will get under way. For our research program and for operation of the orchard at the Medford Experiment Station, this information has enabled us to plan in advance a smooth program of spraying, irrigation and picking."

He had written June 22: "The most important news in this district is the continuation of the pear blight epidemic in the northern part of this Valley. This blight epidemic, which started about the middle of May, is more serious than the one reported in April, 1934. In Sams valley the Edmiston orchard, containing many hold-over cankers, was so seriously affected that all orchard operations for this season were stopped. The adjoining Van Hoevenberg and Day orchards are seriously affected. In these orchards one blight cutter per five acres has failed to check the blight epidemic. In the Central Point district the Richmond, Feldenheimer, Scherer (Elberta Ranch) and Upton orchards have very serious blight epidemics. In some cases such severe cutting of Bosc has been necessary that only the stumps and some scaffold limbs of the trees remain. However, in other parts of the Valley the blight is less serious than usual. Apparently weather conditions during May and early June have favored blight development and the orchards affected either contained or were adjacent to undiscovered hold-over cankers...."

DECIDUOUS FRUIT INVESTIGATIONS

M. A. Smith, Springfield, Mo.

Reporting on activities at the Ozark Fruit Disease Laboratory for the latter part of June he wrote: "During the past two weeks some of the orchards in the district have suffered considerable damage from grasshoppers. Several young orchards which we have seen had all their foliage eaten by grasshoppers within a week's time. Growers are spreading poison bran mash on the ground under the trees and some are also applying a lead arsenate-lime-oil spray combination to the trees.

"Many of the apple varieties which had a rather heavy bloom and apparently a good set of fruit now bear a very light crop. Cold weather during pollination time was apparently responsible for the failure of much of the fruit to stick. A revised estimate of the present crop, at the end of June, is 15 percent for the Marionville district and from 20-25 percent for the Republic district.

"A rainfall of 1.25 inches on the night of June 30th has been very beneficial to all crops."

Grasshoppers

In an informal note of July 16th, Dr. Smith gives us some inside information on the grasshopper attack.

"To give you some idea as to the severity of the grasshopper infestation," he writes, "I must tell you of the account I recently heard. A man was plowing and when he came to the end of a row, stopped his team and went to the house, a short distance away, for a drink of water. When he came back he found that the grasshoppers had not only eaten the two horses, but were pitching the horseshoes to determine which should get the plow!

"It has also been reported that a man here has begun collecting grasshoppers, and he announces that he now has a blue-eyed one in his collection....Of the two stories," comments Dr. Smith, "I am more inclined to believe the first."

We can understand that, of course, since he emphasizes the fact that the man went to the house for a drink of <u>water</u>. But the fact remains that we have numerous blue-eyed grasshoppers right here in Washington. They eat anything, too--especially the higher priced items on the menu. But we don't collect them; they collect us.

Of course, we have blue-eyed peaches, too.

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N.C.

Writing from the Coastal Plain Station on July 4th he said: "I have examined 45 strawberry stolon grafts of yellow on healthy plants which were made on June 8, 13 and 16. In 36 of these there appeared to be a normal graft union, in 4 there was a partial union which was accidentally severed when the grafting tape was removed, and in 5 there was no union. Thus it appears that 15 days is sufficiently long for union to take place, and that the tape can be removed after this period elapses. It is easy to determine whether union has taken place by inspecting the graft; in a normal union there is considerable callus formation. The runners have all been potted and after they have become established the stolons connecting them to the parent plants will be severed.

"Two methods of grafting were employed. In the first, the yellow runner plant was severed from its stolon, and the tip of the stolon was cut into a wedge by two slicing cuts with a razor blade; an oblique cut was then made on the stolon of the normal plant. The wedge-shaped tip of the yellow stolon was then inserted in the cut and the graft covered with grafting tape.

In the second method, neither of the runners on the grafted stolons was removed. An oblique cut was made on the stolon from the yellow plant, running in the opposite direction to that made in the stolon from the healthy plant. Before making these cuts a thin slice of epidermis and cortex, the length of the graft, was removed from each of the stolons. The tongues produced by these oblique cuts were then placed into the corresponding grooves, two cut surfaces of each runner being brought into contact, after which the grafts were covered with grafting tape. Ten grafts were attempted by the second method, and they all made a union....

"There was a big difference in the amount of Septoria leaf spot present on sprayed as compared with the unsprayed plants of Lucretia. .....

"On July 3 I sprayed one lot of the Latham and Cumberland raspberries and Early Harvest Blackberry. It was noted that there is severe anthracnose infection on the canes and foliage of the Cumberland. There is very little present on those plants that have been sprayed to keep the new growth covered, at intervals of about one week.

"On the afternoon of July 2 we had the first good rain we have had in a long time, when 3.41 inches fell. The total rainfall at the station was 2.18 inches during June and 1.51 inches during May."

DECIDUOUS FRUIT INVESTIGATIONS

Leslie Pierce, Vincennes, Ind.

"A hail storm early in June practically destroyed the crop on 320 acres of the Troth apple orchard at Orleans, Ind.," he writes July 10th. "The storm also caused severe damage in the Elrod and Turley orchards in the same section. When examined on June 14, it was estimated that the trees in the Troth orchard had lost more than 50 percent of their foliage. Mr. Troth stated that he lost at least 50,000 bushels of apples in exactly nine minutes. Countless thousands of 17-year locusts are constantly adding to the damage caused by the hail. The hail removed most of the bark from the upper side of the small limbs and the locust are riddling the lower side with their egg-laying activities. The infestation of 17-year locust is so severe in the Bedford-Mitchell-Orleans area that many small trees and shrubs have lost so many small twigs that they have the appearance of having been burned. The combined damage from losust and Oriental fruit moth has resulted in the destruction of approximately half of the young growth on peach trees in the Purdue experimental orchard at Bedford....

"With the exception of a heavy infection of cedar rust, the apple crop in this section is unusually free from disease. This is the first season in the history of the apple industry in the Vincennes section that cedar rust has caused commercial damage. The infection is so severe on the foliage of Jonathan that many of the trees will be almost completely defoliated by the end of the season. The foliage of Grimes in some orchards is also badly damaged. The disease has destroyed as high as 10 percent of the fruit in some plantings of Rome.

"A survey of the winter injury to peach trees in our experimental orchard made the last week in June showed that we have 503 good trees, mostly Elberta, 247 trees in various stages of recovery from the effects of the freeze, and 531 dead trees. All of Hale and South Haven trees in the orchard were killed by the freeze of last January. It has been estimated that 75 percent of the peach trees in Knox county died this season as a result of the freeze."

R. B. Wilcox, Pemberton, N. J.

Writing for the June 16-30 period he reported most blueberry fields as dry and some suffering from lack of water, the dry weather hastening the start of the picking season...."We have been taking comparative figures on control of the cranberry false-blossom vector by various methods: Pyrethrum or mixed dusts applied with airplanes, autogiros, or ground machines; pyrethrum extract added to spray of bordeaux mixture and applied in the usual way; or pyrethrum in kerosene, applied with an airplane. With the latter mixture we have also tried to detect any injury to cranberry flowers, fruits or leaves. It is too early to draw conclusions from any of these tests...."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J. (continued)

"The third commercial application of copper-lime dust by autogiro was made on a large bog and the results are being watched with interest," he writes from the Cranberry and Blueberry Disease Laboratory July 15.

"The second week of the July 1-15 period was characterized by extreme heat. Successive maximum temperatures at Pemberton from the 9th to the 12th were 105, 106, 104 and 99°F. Gardens, fields and pastures showed the effect of the heat; raspberries wilted; the tomato crop was reduced; corn and potatoes were injured. The blueberry picking season was at its height and possibly half of the fruit remaining on the bushes was shriveled or otherwise hurt; where there was a scarcity of water, many bushes were badly hurt if not killed.

"The effect of the heat on cranberries is less conspicuous but probably serious. Runners lying on bare sand, as in young bogs, were generally killed, and berries in contact with the sand were completely cooked. Fruit and vines also suffered, to a greater or less degree, wherever water was not plentiful. Many later-drawn bogs were still in bloom, and it appears that a good many of the blossoms will fail to develop. Conditions can be seen more clearly later.

"Approximately 2,400 acres of New Jersey cranberry bogs have been dusted during the past month, by airplane or autogiro, for leaf-hopper control, with various results. In addition, ground dusters of one sort or another were used, and at least 200 acres were sprayed with bordeaux mixture containing pyrethrum. All of this work was done on a commercial scale, and we have checked the results in as many cases as possible. The records indicate that no single method yet tried can be relied upon to give a perfect control of leaf hoppers in the very heavy vines which are typical of many Jersey bogs. The power duster operated on the ground appears to have the highest score at present.

"The latest method of leaf-hopper control to be tried is still in the purely experimental stage; this is by means of pyrethrum extract in kerosene (essentially 'fly spray'), applied to the bogs by airplane, at the rate of from 6 to 10 gallons per acre. Under favorable conditions a good coverage was obtained, and there was considerable control of insects. Our connection with this work was to determine the effect of the spray upon blossoms, fruit and vines. On the two bogs sprayed last month, we were unable to detect any blossom injury after one week.

"The plane was brought back this last week for further tests, and observations will be continued; they will include determinations of the relative sizes of sprayed and unsprayed fruit at picking time."

DECIDUOUS FRUIT INVESTIGATIONS

Magoon in Charge Eastern Grape-Production

Effective July 1, Dr. Charles A. Magoon, who for the past two years has been working primarily on problem of grape utilization, assumed direct charge of our eastern grape-production investigations. In this connection, Dr. Magoon will not only have direct charge of the grape-production investigations at Beltsville, Md., but will assume the administration in the Washington office of the cooperative grape investigations at the Sandhill Station, Columbia, S.C., the station at Poplarville, Miss., the Coastal Plain Station at Willard, N.C., also the grape project which is being developed at the Meridian, Miss. station. Dr. Magoon will also handle such utilization studies as may be conducted on eastern grapes.

Dr. J. R. Magness, in charge of the deciduous fruit production project, states: "Since the retirement of Mr. George C. Husmann about four years ago, we have had no project leader who could devote his full attention to the handling of the important eastern grape work. We are very glad that an arrangement could be worked out whereby Dr. Magoon could take over the active leadership of the grape investigations. With an extensive program of grape breeding, cultural investigations, and rootstock studies under way for the Eastern States, it has become absolutely necessary that someone who could devote full time and attention to this project be assigned to it. Dr. Magoon is already familiar with the utilization end and has had considerable experience with grape varieties in connection with that work. He will rapidly become recognized as a leader in the field of grape work in the United States."

Henry F. Bain, Wisconsin Rapids, Wisc.

Writing for the week ending July 11, he says it was one of extremely high temperatures which cooked at least half of the berries in his crosses, with the end not yet in sight.

"A great many vines at the nursery have been killed either by direct heat or by drying out the first day of the hot spell. They were irrigated the night afterward. There has undoubtedly been some damage to the crop in general.

"July 7 and following our maximums were 103, 101, 101, 99 and 98 (by 2:45 pm--it got hotter later)--all official Government Station readings. This is being written Sunday, July 12, and the maximum will be at least 103 I think. The first two days reported had a strong, drying south wind in addition to the high temperatures."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"Cross pollination of cranberry varieties was completed this week," he writes from the Cranberry Disease Field Laboratory on July 18th. "The 'set' on those pollinated first is very good.

"The second and final application of spray for this season was made on experimental plots on two bogs. One of these is our most extensive series. The second application of spray was omitted on some plots on the State Bog which are being sprayed with sulfur. The vines on these plots show considerable sulfur injury in spots. This is probably due, to a large extent at least, to the very hot dry weather which we have been having.

"The dry weather is apparently reducing the number of berries setting. Some bogs which had a very heavy crop of blossoms are setting fruit very poorly and irregularly. Many of the berries from flowers which bloomed later are not increasing in size and may not develop berries unless rain comes soon.

"Blueberries are ripening. The first general picking for the season was begun this week. The yield is average and berries are of good size. Prices vary from 35-45 cents, those farther down the Cape bringing the higher price."

John C. Dunegan, Fayetteville, Ark.

"The dry weather has practically eliminated fungus diseases in the apple orchards but has favored the codling moth," he reported for the week ending July 11th.

"Mr. Isley of the department of entomology informs me that the moths are multiplying rapidly and in some of the orchards the prospects are for a very severe infestation next year.

"The April freeze did not eliminate the crop completely and there is enough fruit scattered through the district to allow the moth to carry over. Only a few growers apparently have had enough foresight to pick off the few apples left in their orchards.

"In some parts of Benton county the farmers also have a grasshopper outbreak to contend with. The situation in Washington country is not so serious. The extension service is making plans to distribute poison to the farmers in various parts of the State to control the pest."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Striking control of walnut bacteriosis was obtained in tests carried on in the orchard of W. G. Brown near Laurel, Oreg.," he writes for the week ending July 11. "In this orchard the incidence of blight infection on the nuts was reduced from about 56 percent to about 6.1 percent by two treatments of bordeaux mixture applied just before and immediately after bloom. Even better results were secured in the plot sprayed with bordeaux mixture 2-2-50 plus 4 von 'Emulsifine' dormant spray oil, 1 quart to 100. In this plot only 1.6 percent of the nuts examined were infected with bacteriosis. Bordeaux mixture 2-1/2-50 in this orchard gave practically as good control as did bordeaux 2-2-50, the incidence of the disease on the nuts being 7.4 and 6.1 percent, respectively."

He had written earlier that results taken the latter part of the week ending July 3, of spraying for the control of the bacterial blight disease of filberts, give still further proof that timely treatments of bordeaux mixture will materially reduce the number of current infections due to this disease. "Thus, in a test carried on in a 3-year-old Barcelona filbert orchard located near Silverton, Oreg., 61.6 percent of the trees in the untreated plot were moderately to severely infected, whereas in the plot sprayed with one fall and one spring treatment of bordeaux mixture 4-4-50 only 10.8 percent of the trees were moderately to severely infected (2.2 percent severely infected)."

J. R. Cole, Albany, Ga.

"We seem to be going from one extreme to another here this season," he writes from the U. S. Pecan Disease Field Station on July 18th. "One week ago we reported 'dry hot weather, with no new scab infection,'. This week, however, there has been a complete change in both weather and scab conditions. We have had from light to heavy rains daily during the past week, with maximum temperatures of from 85 to 90° F.

"It appears that the old scab stromata have about stopped sporulating at last. Only two spores were found on the Schley stromata while none were found on the Delmas. It will also be interesting to see if the recent rains revive these stromata and start them sporulating again."

The following comment occurred in the report of July 11: "Mr. Moznette has been complaining of spray and drought injury in his plots located in the Van Cise orchard. The plots of Mr. R. D. Lewis, also in the Van Cise Orchard, that were sprayed according to our schedule and recommendations, are free of drought and spray injury. Our sprayed plots are also free of this injury."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"Observations made on the trees sprayed with borax in various concentrations for the attempted control of pecan leaf scorch showed no definite results either in causing spray injury or control of the leaf scorch," he writes for the week ending July 11. "An apparent varietal difference was noted in the effect of the leaf scorch in that the trees of the Desirable variety had shed about one-half their foliage from this cause, while Schley, Stuart, Pabst, Moore, and Success had lost no appreciable amount.

"No rain has occurred during the week although other sections of the Southeast received enough to effectively relieve the drought. Since May 1 the rainfall recorded at Philema totals 5.01 inches. Most of this came at two well separated periods so that no great amount of drought injury has as yet occurred. Rain is badly needed now. Temperatures have remained above normal although the record temperature of 104°F. near the end of June has not again been reached."

He had written July 4th: "The irrigation work will probably have to be continued unless rains are obtained. Local showers have fallen in some cases in sufficient quantities to effectively relieve the moisture shortage. In other sections no rain has fallen for almost three months. and field crops are almost entirely dried up and pecans are reported to be dropping heavily.

Fortunately we have obtained fair rainfall on most of our experimental plots. Some nuts are dropping at Philema, no doubt due to the moisture shortage. The cover crops are wilting regularly every day but no defoliation of the pecan trees has yet been noted. If the high temperatures experienced during the past week and lack of rainfall continue, it is probable that we will experience a very heavy drop of nuts."

B. G. Sitton, Shreveport, La.

Writing from the U. S. Pecan Field Station on July 6th he reported that on July 1-3, 3.30 inches of rain fell. "This apparently has done a great deal of good although I doubt if the soil has been wet to its entire depth because it was dry to six feet before the rain occurred," he comments.

Approximately the same rainfall, 3.55 inches, occurred at the Robson, La. station during the week ending July 6, with but very little run off.

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U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Vegetable Crops (Geo. P. Hoffman)

"On Wednesday, July 8th, the first officially recorded harvest was made from our tomato plots. Considering unfavorable weather, the yield was fair to good. It is interesting to observe that selections of rich red color have shown much less tendency towards decay and have held up much better under extreme heat than selections of pink color. It is unquestionably true but for deep setting--all plants having been set with a post hole digger and to a depth of 12 or more inches--this planting would have been almost a total failure as a result of the prolonged dry spell."

Nut Fruits (Atherton C. Gossard)

"Because pecan rosette has developed to a widespread extent in the Schley-Moore block in the station pecan orchard in spite of an application of zinc sulphate averaging one pound per tree, depending on the size of the tree, on April 6th of this year, it was thought best to make some zinc sulphate spray applications this summer. Accordingly, this block of trees was sprayed on July 6 and 7 with a zinc sulphate solution, 2 pounds to 50 gallons of water. Sprays will be continued at about 3-week intervals as long as the trees continue to show shoot growth. It is hoped that the sprays and another soil application of zinc sulphate next spring will greatly reduce both in severity and in amount, if not eliminate, pecan rosette in this block of trees next summer."

During the week ending July 11, weather continued dry and very hot. Local showers touched points nearby the station, and a downpour with hail was had in Meridian.

ADMINISTRATIVE NOTE

Destruction of Papers. A memorandum from the chief of the Division of Operations to chief clerks of bureaus states that he has been indirectly informed that one of the field offices of this Department contemplates the destruction of some old papers, and calls attention again to the notice sent out last April:

> "Pending final classification of the National Archives Council of those papers in the files of the Department of Agriculture, situated in Washington or elsewhere, which have permanent value or historical interest, all departmental orders now in effect permitting destruction of papers are suspended."

In other words it is absolutely essential that you secure prior approval from the Secretary through Dr. Auchter before destroying any papers or documents.

ADMINISTRATIVE NOTES

Automobile Lettering. Once upon a time, we are told, a woman called in a sculptor and explained about the lettering she wanted chiseled on her husband's tombstone. After the name, dates of birth and death, she wanted the words "TO MY HUSBAND" added in a suitable place. The man assured her he understood, so she was considerably upset on going out to survey the finished job to find the tombstone lettered: TO MY HUSBAND IN A SUITABLE PLACE.

What we are getting at, of course, is that all official cars and trucks must bear the Department's name. There have been quite a number of replacements and new car purchases during the past six months and we are wondering--at least Roy Gillette is--whether all have been labeled. If your official car is not lettered, send at once for a set of the decalcomanias used for this purpose. The shield and insignia should be on each side of the car.

Incidentally, some employees have indicated that they have had difficulty in transferring the decalcomanias to the cars. The instructions point out that the space should be cleaned thoroughly with clean cloth and gasoline, the transfer must have the paint side wiped clean before applying varnish, and the varnish must be applied both to the transfer and the space on the car, thinly and evenly, and allowed to become "tacky." If there are no instructions with the decalcomanias sent you, better play safe and write us for them before attempting the job of labeling the car.

Prison-Made Articles. Experience is what you get when you are looking for something else, and we regret to note from copies of decisions of the Comptroller General recently sent us that another man has found out that purchasing in open market things that we are required by law to purchase from Federal prisons simply means that he has to pay for them personally.

As Par 3346 of the New Department Regulations points out, products of the Federal Prison Industries must be purchased when such articles are required. These industries include broom and brush, clothing, mattresses, hoe, rubber, and textile mills. The Comptroller General has definitely ruled that we MUST buy such items as deck mats, brushes (all kinds--paint, varnish and floor), canvas, cloth bags, brooms, tentages, gray iron, bronze and aluminum castings, etc. from Federal penitentiaries. There is no authority for purchase elsewhere unless we can prove the penitentiaries were unable to furnish the articles. Save yourself time and money by placing orders for such things through the Washington office, letting Ray Jones do the explaining.

ADMINISTRATIVE NOTES

Bills of Lading. There are always some things we can count on--our fingers, for example. Then there is the matter of failure to execute the Certificate of Issuing Officer on Government bills of lading. It is perfectly astonishing how often the Bureau's accounting officers have to return these papers for completion. The Certificate must be filled out, you see, before the accounts can be paid officially. It sorts of gets on the accounting officers' nerves in time, and they come over and tell us what they think of US. Of course, to drop into rhyme, we can and do pass the buck to you, but our ears always burn for a day or so afterwards. Please help us build up friendly relations with the Bureau's accounting staff by seeing that any bills of lading you may send out are properly executed.

APPENDIX

As a rule, the NEWS LETTER has no use for an appendix. This particular note is merely to inform the friends and relatives of John C. Dunegan that he hasn't either--anymore. He returned to duty early in July after a 17-day absence during which he lost his appendix. It seems it has been annoying him for some years, but in June it just went too far, and he lost patience with it.

If it is any consolation to J. C., Mr. W. W. Gilbert, in charge of the editorial work for the Division, says that an appendix is rarely necessary in the Department's publications. This apparently is his way of implying that one is not necessary in Department employees either. Too, the editorial staff offer a number of other suggestions, to wit:

(a) Matter that is supplementary should be placed in the appendix.
(b) Tables that contain data not essential to the text, and tables in great detail and not of interest to all readers, should be placed in the appendix.
(c) Tables and footnote references in the appendix should be numbered consecutively with the text.
(d) Literature Cited should follow the appendix.

As to (d), it is our notion that if Literature Cited is causing no particular trouble to J. C., it is questionable whether it should follow his appendix. Let it ride, say we.

Our medical friends suggest, however, that a careful watch be kept over one's Table of Contents, to make sure that nothing is included that should be left out. Unless, of course, one is trying to demonstrate that his Equator is not really an imaginary line.

Vol. 8 No. 15 August 1, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This NEWS LETTER is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. VIII Washington, D. C., August 15, 1936 No.16

Baseball--- and Research

Truth crushed to earth will rise again--but sometimes after they've counted ten. So, as a baseball fan of 40 years' standing and a few sitting, I have become a trifle discouraged about finding vindication for my belief in the importance of the game. Of course, I wanted a horticultural vindication. As it happens, it is cotton that comes along to prove my theory all wool and a basebal yard wide.

Our Daily Digest quotes an editorial in Farm and Ranch concerning one-variety cotton culture. It tells of a county that has been brought around to the realization that a field of purebred cotton among fields of short staple or other varieties is not going to produce pure seed for planting the following season, so the growers have organized for one-variety planting. What pleases me, however, is that the move received its impetus in a county where the farmers are much interested in baseball. It was at the baseball games, you see, that they met, became acquainted, and finally got around to discussing ways and means for improving agriculture.

Here we have a clean-cut demonstration of the value of baseball in encouraging agricultural cooperation in the improvement of varieties and methods. Baseball, consequently, is going to mean thousands of dollars to this particular community merely because of its part in bringing about one-variety cotton planting. We should aid in spreading interest in the game among farmers! Specifically, too, we must seek ways and means to bring about the substitution of fruit juices for the synthetic drinks now sold at ball parks. Perhaps, too, we can develop a horticultural substitute for the "hot dog." We've already provided bigger and better peanuts.

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

"The warm weather of the previous week continued during the first three days of the past week," he writes July 27th, "with maximum air temperatures in the orchard between 90° and 96°. The resultant high evaporating power of the air caused Livingston's standard white atmometer to lose between 102 and 106 grams of water per day on July 21, 22 and 23; thereafter cooler weather caused a somewhat lower evaporating power of the air.

"I believe this high evaporating power of the air was responsible for the sudden yellowing of most of the leaves on five or six of the less vigorous, young Old Home pear trees in Block 2. I interpret this yellowing as the effect of an acute water deficit in these trees, in spite of the fact that Block 2 had recently been irrigated and the soil was much too wet to disc. Microscopic examination of the fine roots failed to show any of the typical, new rootlets for trees with yellow foliage, but did show an abundance of new rootlets for normal trees. Apparently, for some reason these trees whose foliage turned yellow were unable to obtain moisture from this wet soil fast enough to prevent acute water deficiencies in the leaves. The lack of new rootlets is tentatively being considered the cause rather than the result of the acute water deficiency in the tree. This condition seems important to me, in that it indicates the possibility of acute water deficiencies under conditions of high available soil moisture in close proximity to the feeder roots."

He had written July 20th: "Pear fruit measurements thus far show that 'dry' plots, which previously had been showing only slightly slower fruit enlargement than 'wet' plots, are responding to the warmer weather with very greatly reduced fruit enlargement as compared with 'wet' plots.... This again substantiates my contention that tree response to soil moisture, at least in heavy soils, is more closely related to transpiration losses than to amount of available soil moisture.....

"This year it is our plan to compare shoot and spur leaves for both Bartlett and Bosc as well as for Anjou in both medium and heavy pruning in both New Dry and New Frequent soil moisture plots. Although our results in 1934 and 1935 did show shoot leaves about 20 percent more efficient per unit area than spur leaves, I am anxious to check these observations very thoroughly this year.....

"In some Bosc orchards fruit malformation associated with 'measles' is more serious than last year. For instance, in 1935 the Rogue River Orchards Company packed some 27,000 boxes of Bosc and of the 8 percent culls, 70 percent was due to 'measles' malformation. This year the company expects an even greater cullage due to 'measles' malformation of fruit."

DECIDUOUS FRUIT INVESTIGATIONS

Beauty Treatments for Apple Blossoms?

I hope Dr. Magness sees this, because I want to prepare him for a shock. The handwriting on the wall indicates that the time is coming when it will be necessary to add a beauty specialist to the apple project staff to look after the trees and especially to take the necessary steps to make the apple blossoms attractive to bees and other insects. Either that, or another George Washington to cut down the cherry trees. This prophesy is based on observations by C. P. Harley at Wenatchee, Wash. that seems to make it rather clear that the superior attractiveness, so far as the insects were concerned, of cherry blossoms over apple blossoms led to a reduced pollination and smaller apple crop in the Wenatchee district this year.

"We have been interested in determining the cause of the lowered tonnage of apples in the Wenatchee district this year," he says in his report of July 23d. "In checking over the various factors which may have been an influence we have concluded that pollination was the most likely offender. It will be recalled that practically all fruits, regardless of type, were in full bloom at practically the same time. Apparently the insect activity was greater in the fruits which were more attractive to them and we have a suspicion that the cherry trees were the ones selected. Many of the more isolated orchards, similar to Ribbon Cliff, which had no cherry trees to speak of, set a very heavy crop, whereas other apple orchards located near cherry trees seemed to have a lighter crop. This is especially true of Delicious.

"Many growers thought that the weakened spurs, due to the cold winter, might be responsible for the light set of apples. However, this apparently is not the case for the trees bloomed very heavily and in orchards where hand pollination was practiced, from 20 to 100 percent better set was realized. This seems to indicate that if the spurs were weakened by the low temperatures it was not sufficient to prevent the set of fruit, providing other factors were present to facilitate it. Another indication which points toward the cherry tree is the fact that cherries all over the district set an unusually heavy crop which further indicates that insects seemed to prefer cherry bloom to apple. More interest is being shown in hand pollination by the grower each year and I would not be surprised if a rather large percentage of growers will be practicing hand pollination in a few years. Many experienced some difficulty this spring, especially those attempting it for the first time. Apparently the pollen was not dried properly in most cases."

There will be a wide field for this new project employee in determining just how much Nature may be helped in the matter of attracting pollinizers. Let him--or probably her--take charge of a single tree and demonstrate what can be done by a blonde flower, say, in the matter of attracting the insects. A little rouge, a touch of exotic perfume--for, after all, there must be a lot of insects no smarter than the average man.

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash. (continued)

"Estimates of the 1936 crop for the Wenatchee-Okanogen district have been made," he reported July 16th. "The estimated crop this year is somewhat less than that of last and it is given as 14,330 cars of apples, 1,122 cars of pears, 209 cars of apricots, 141 cars of peaches, and 22 of plums and prunes. There is a possibility that the apple estimate is somewhat low for I suspect that they are considering the possible reduction in the present crop through late codling moth damage. It is the concensus of opinion that perhaps there are very close to 16,000 cars of apples now on the trees.

"Several orchards have reported rather serious outbreaks of fire blight this year on pears. Apparently the exceptionally wet spring and moderately cool weather which followed are responsible for the blight getting so well established in certain orchards. Most of these infected orchards are located in the higher elevations. We have not been able to make any observations in the Okanogan district this year and have had no word as to their condition there in respect to fire blight. Normally it is a matter of greater concern there than in the Wenatchee district proper."

H. F. Bergman, East Wareham, Mass.

"Blueberries are still abundant and the price remains at 40-45 cents with somewhat higher prices farther down the Cape," he reports August 1st. "A few of the growers have picked most of their crop." He had written earlier (July 25th) that several good showers during that week had improved conditions on the cranberry bogs. "The young fruits have developed rapidly, most of them now being half to two-thirds of the mature size," he wrote. "The set has not been as good as in some years, and in some instances has been very poor, but there will be a good crop."

C. A. Meckstroth, Willard, N. C.

Writing from the Coastal Plain Station on July 18th, he says: "Last week I had an opportunity to see a strawberry field that had been burned over after harvest. The owner told me the tops of the plants were all dead and dry at the time of burning, having been killed by severe leaf spot infection. The tops had not been cut off. He simply touched a match to the field when everything was dry. There was evidence of severe injury to the crowns from this burning. A portion of one row he burned more thoroughly than the rest, and in this part nearly all the plants were killed."

PRUNE RUSSET

A good bit of interest has been aroused by Dr. Paul W. Miller's reports from Corvallis, Oreg. on studies of prune russet. This russet has assumed considerable importance of late years and the question has arisen as to whether it is something new or merely an old problem given new importance by changing conditions.

Pioneer growers of prunes in Oregon have told Dr. Miller that this russet, or "prune scab" as they call it, has been present in varying amounts every year as far back as they can remember. In the old days, however, when the prune industry was in its infancy, the demand exceeded the supply and buyers did not discriminate against the damage.

By 1920 considerable acreages of prunes were planted and as these trees have come into bearing the supply of prunes has more than equalled the demand. Buyers are more discriminating now and have tightened down on the russet tolerance. The situation has become so acute, in fact, that the growers demanded an investigation to determine the exact cause of the condition and to ascertain what, if anything, can be done to mitigate the damage.

There are a number of growers in western Oregon who contend that the amount of russet is on the increase. It is Dr. Miller's idea that this may be associated with a reduction in the forest acreage. In recent years many acres of forests have been cleared in western Oregon with the result that the orchards are subject to more violent wind storms than was formerly the case when forests acted as natural windbreaks.

It will be recalled that in one of his reports last June Dr. Miller commented on studies of the cause of russet and mentioned that a number of prunes in celluloid cages, subjected to the work of thrips, developed small russeted areas located mostly at the apical end. However, in only a very small percentage of the fruit so affected were the areas of sufficient size to cause the fruit to be rejected from the top grade. In most cases the areas would not be noticeable after the fruit had dried.

On the other hand, fruits experimentally rubbed, shortly after shuck fall, with stems of twigs were badly russeted. It appears therefore, that mechanical injury due to the rubbing of the fruit against stems of twigs and sharp edges of leaves, is the principal cause of the type of russet that results in economic loss.

In an Italian prune orchard near Amity, Oreg. Dr. Miller found only about 2 percent of the fruit on a "boxed" tree badly russeted, whereas approximately 13 percent of the prunes on trees outside the windbreak were badly affected.

DECIDUOUS FRUIT INVESTIGATIONS

Henry F. Basin, Wisconsin Rapids, Wis.

"The week was spent principally in making observations on three cranberry problems," he writes for the week ending July 25th; "effect of 10 days of extreme and unprecedented heat during the blossoming period upon setting of berries; effectiveness of airplane dusting in controlling the leafhopper which carries false blossom disease; and upon an experiment in the control of water alkalinity by sulphur treatments, conducted in cooperation with the Wisconsin Experiment Station and the Wisconsin Department of Agriculture.

"Setting of fruit has undoubtedly been reduced by the heat. In the cross-pollination, where uprights were enclosed in glass containers, less than 25 percent set resulted; many berries which at first appeared to start growing later ceased growth. Air temperatures at vine level on the bogs were recorded considerably in excess of 120° F.

"An apple orchard near Berlin, Wis., was observed where a material percentage of the fruit was sun-scalded, most of the more exposed fruit being rendered useless.

"There has been no general or heavy local rain in the central or northern parts of the State, and temperatures, though not so extreme as early in July, are nevertheless high enough to continually intensify the effect of the drought."

John C. Dunegan, Fayetteville, Ark.

"Another full week of high temperatures," he reports for the week ending July 18th. "There have been several showers of short duration in the territory surrounding Fayetteville but the town itself has received no rain. One storm the afternoon of July 15 centered in the valley between Springdale and Fayetteville. The rain was accompanied by high winds which blew down a number of apple trees, damaged some grape vineyards, and removed about half the crop of apples in one of the Brogdon orchards....

"I examined our spray plots at the Ruppel orchard on July 16. The trees in the check plot which had received only arsenate of lead, were badly infected with various leaf spot fungi and showed evidence of premature defoliation. The trees in the sprayed plots still showed an abundance of spray residue on the leaves, only occasional traces of leaf spotting, and very little defoliation."

NOT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"Most of the week ending July 18 was spent in the field in the vicinity of Silverton, Oreg. taking results of spraying and dusting tests for the control of walnut blight.

"Results of tests carried on in the Silverton district are not as satisfactory as tests carried on in the Scholls district. Nevertheless a significant reduction in the incidence of the disease has followed spraying with bordeaux mixture even though the results are not so outstanding. Thus in tests carried on in the orchard of T. L. Leonard near Silverton, two applications of bordeaux 2-2-50 applied in the prebloom and postbloom stages of development respectively reduced the incidence of the disease on the nuts from about 95 percent to approximately 20 percent. Bordeaux mixture 2-1/2-50 in this orchard gave almost as good results as did bordeaux 2-2-50, the incidence of the disease on the nuts being 20 and 23 percent, respectively.

"Copper oxalate 2-50, cuprocide 1-50, copper-hydro '40' 2-50, and basicop 2-50 were all inferior to bordeaux mixture 2-2-50, the incidence of the disease on the nuts being 31.5, 59, 64 and 51 percent, respectively.

"Evidence of a cumulative benefit from bordeaux spraying was also obtained from results taken in this orchard. There is one row of trees in Mr. Leonard's orchard which was sprayed with bordeaux this year for the first time. The incidence of the disease on the nuts in this row was 42 percent. The remainder of the orchard has been sprayed for two consecutive years. In this part of the planting approximately 21 percent of the nuts examined contained blight lesions.

"Results of dusting tests for the control of blight were also taken during the week. One of the dusts used, namely a copper-lime dust containing 30 percent monohydrated copper sulfate, 67 percent lime and 3 percent gludust, gave very good results in tests carried on in the vicinity of Sublimity, Oreg., reducing the incidence of infection from 90 to 14 percent.

"The remainder of the dusts used, including a 7 percent cuprocide dust (93 percent talc), a 50 percent copper phosphate dust (47 percent diatomaceous earth, 3 percent gludust), a 50 percent copper hydroxide dust and a copper ammonium silicate dust, gave much poorer results, reducing the incidence of infection on the nuts from 90 percent to a range of 28 to 42 percent."

NUT INVESTIGATIONS

J. R. Cole, Albany, Ga.

Writing from the U. S. Pecan Disease Field Laboratory on July 25th, he said: "We have an excellent experiment in the Waugh orchard this year with the 3-1-50 bordeaux mixture showing up best, giving excellent control of the scab fungus and a very good crop of nuts that are larger than in most orchards in spite of the extreme drought that has prevailed this season. There is no sign of the black aphis infestation on any of the plots nor has there been any sign of spray drought injury on any of the plots.

"The fourth and last scab spray application was made in the Taylor orchard this week. As in the Waugh orchard, some burning resulted from using the 1-50 ccoper sulphate with 1-50 summer oil emulsion. There was no sign of burning where the copper sulphate and calcium arsenate, 1-1-50 was used. We used the calcium arsenate in all of our experimental plots in the Taylor orchard. We reduced the lime though as follows: 2-1/2-50 bordeaux mixture was changed to 2-1/2-1-50, the 1 being calcium arsenate. Too, 3-1-50 bordeaux was changed to 3-1/2-1-50, and 3-3-50 to 3-2-1-50. We have excellent experiments in this Taylor orchard and are going to get some good results there this year, I think. For instance, the only black aphis infestation has been on the 3-3-50 bordeaux mixture plots and it was necessary to add nicotine sulphate to this spray to control this infestation. Black aphis infestation was also on trees that were adjacent to these 3-3-50 plots regardless of the spray application that they had received. I certainly hope this is the last season that we will be required to use the 3-3-50 bordeaux mixture because regardless of bordeaux drought injury, it is the opinion of Mr. Large and myself that this spray has no place in our program for scab control. The 3-1-50 and the 2-1/2-50 bordeaux mixtures both look better at this time than the 3-3-50.

"Regarding the injury on the copper oil plots, one interesting thing is that there is no sign of injury on plots receiving the bordeaux mixture combined with the summer oils either 1-50 or 1-100, so the oil apparently acts in some way with the copper sulphate to cause this injury.

"Another interesting part of our spray program is a comparison of the amount of spray required for the first, or prepollination spray application compared with the later spray applications. It takes three times as much spray to cover a tree for the summer spray applications as it does for the spring or prepollination spray. Trees that only require 10 gallons of spray to get good coverage in April, require 30 gallons now in July. If we can time this prepollination spray as it should be, I believe it will be one of the most important applications in our entire spray program."

NUT INVESTIGATIONS

C. L. Smith, Austin, Texas

Reporting on pecan investigations in Texas, he writes for the July 13-18 period: "There has been plenty of rain in this section, and the rains have been frequent enough to keep the humidity relatively high so that the Burkett variety in lowlands is seriously affected with scab. In orchards at Bastrop and Smithville, where in most seasons scab has done no damage, the Burkett, Texas Prolific and similar susceptible varieties are seriously damaged.

"On July 15 and 16 over 5 inches of rain fell at Austin in less than 15 hours. However, at Arlington there has been a deficiency of rain, and drought is affecting that section to a considerable degree. At the Brownwood station the rainfall has been just about sufficient to maintain the soil moisture at a good level for the trees, except where heavy weed growth has occurred in orchards of bearing trees.

"The pecan crop in the State will be very small this year. The April freeze damaged the trees in the northern part of the State, and there were only a few acres over the rest of the pecan belt where a good set of nuts occurred. The nut case-bearer has taken a heavy toll of nuts in these sections. A few growers have sprayed for case-bearer and have apparently secured good control."

For the July 20-25 period he wrote: "We have just run across a small native pecan grove a few miles from Brownwood on the Colorado river where there is a heavy infection of scab. The crop on most of the trees in this grove will be seriously damaged, and completely ruined on many individual trees. This is the heaviest infection of scab that we have found that far west, regardless of location, and is the greatest damage we have seen in Texas on native trees. From all reports it is probable that scab has done a great deal of damage in this grove for several years."

Max B. Hardy, Albany, Ga.

"The first part of the week was hot and the soil was drying out rapidly," he writes from the U. S. Pecan Field Station and Laboratory on August 1. "On Friday morning, however, we began to feel the effects of the tropical storm progressing northward over the Gulf of Mexico. The temperature dropped materially and from Friday morning at eight to Saturday morning at eight, 3.50 to 4.00 inches of rain was received, accompanied by fairly strong winds. The rains are continuing and at least another inch of rain has fallen. The recorded rainfall at Philema during the month of July totals 9.61 inches, all of which was received during the period July 12 to 31, inclusive."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS

J. M. Lutz — J. M. Lutz of the Section of Handling, Transportation and Storage, and Market Diseases of Fruits and Vegetables, has been assigned to duty at the U. S. Horticultural Field Station, Route 6, Meridian, Miss., where he will make his permanent headquarters.

L. A. Fletcher — Dr. Fletcher reports that the week ending July 25th was spent in harvesting grapes in the bunch grape vineyard. The varieties harvested were Delaware, Hartford, Niagara, Manito, Cloeta, Brighton, Lucille, Lutie and Ives. "The Delaware variety, which is planted on several rootstocks, showed a number of color variations (light pink to purplish pink). On its own roots the variety seems to be less mature than on other rootstocks."

Geo. P. Hoffman — "The short crop, and resulting high prices received for spring potatoes, has greatly increased interest in the midsummer planted or fall crop. The Triumph is the popular and most planted variety in this section. We are planting at the station small plots of several selections and varieties, including the so-called 'Lookout Mountain.'"

He adds: "Our grapes, pecans, tomatoes and asparagus are attracting much attention and as a result interested visitors continue to increase in number and in number of parties."

ADMINISTRATIVE NOTES

Tires Tubes — We frequently receive letters from our station men telling us that they are awaiting blank forms so that they may place their orders for tires and tubes. These forms haven't been used for some years, being discontinued at the time manufacturers were pricing tires in accordance with NRA codes. Since then "definite quantity" orders have not been placed. Instead contracts have been made with various tire manufactures and dealers for supplying tires and tubes to all parts of the United States.

Until further notice, therefore, please send our business office your orders for tires and tubes as you need them and we will see that the orders are placed immediately. Be sure to state size, ply, etc. of the tires needed, and state your preference (giving second and third choices, too) as to make of tire, and if practicable that make will be ordered.

In some zone areas three or four makes are available; in other zones but one make can be obtained.

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASES INVESTIGATIONS.

Carbon dioxide Retards decay. Back in 1932, Dr. Charles Brooks and his associates put out Technical Bulletin No. 318, "Effect of Solid and Gaseous Carbon Dioxide upon Transit Diseases of Certain Fruits and Vegetables." The studies reported on were undertaken not so much with the idea of developing a method of storage as with the hope of finding at least a partial remedy for the spoilage that results from the warm condition of fruit and vegetable products during the first hours after loading for shipment. Spoilage in the orchard at picking time involves only the cost of growing the crop, whereas a loss on the market adds to this the cost of picking, packing and shipping. Too, a smaller crop is sometimes compensated for by higher prices, but spoilage of part of a shipment is apt to ruin the market for the sound fruit as well as for that diseased as neither dealers nor consumers care to take a chance on a product that shows signs of spoilage.

Experiments were carried out at constant temperatures with a constant percentage of carbon dioxide, and also in "pony" refrigerators and in standard refrigerator cars where both the temperature and the percentage of carbon dioxide were continually dropping during a considerable part of the period of the experiment. The control of diseases and other forms of spoilage was readily accomplished, but the effect of the carbon dioxide upon the flavor of the product was found to set definite limits to the method.

Further studies and experiments are reported on in Technical Bulletin No. 519," Transit and Storage Diseases of Fruits and Vegetables as affected by Initial Carbon Dioxide Treatments," by Charles Brooks, C. O. Bratley and L. P. McColloch.

"It is generally recognized that the keeping quality of fruits and vegetables is greatly influenced by the conditions that prevail between the time the product is harvested and the time it reaches a fairly low temperature in transit or storage," they point out. "Delays in cooling are responsible for much of the spoilage that develops later in transit, in storage, or on the market. Prompt precooling adds greatly to the storage life of the product, but unfortunately the facilities for this are not generally available. Even when the produce is placed promptly under refrigeration, 1 to 3 days may elapse before the field heat is removed and a sufficiently low temperature attached. This is particularly true when the warm product is loaded in a refrigerator car without precooling."

Exposure to carbon dioxide gas has been shown to furnish as rapid a method of retarding the softening and decay of certain products as precooling and to bring them under control far more speedily than is usually accomplished in a refrigerator car, but, as pointed out in the earlier bulletin, the treatment has its limitations in the fact that prolonged

exposure to atmospheres containing a high percentage of the gas may result in objectionable changes in the flavor of the product.

The results of short-period carbon dioxide treatment are reported for more than 40 different fruit and vegetable products. Decidedly favorable results were obtained with sweet cherries, plums, peaches, Bartlett pears, raspberries, dewberries, blackberries, figs, grapefruit and oranges. (On oranges and grapefruit, Penicillium digitatum and P. italicum were held in check better than Diplodia natalensis and Phomopsis citri.) Fruit that was exposed to carbon dioxide had less decay and was firmer and fresher than similar fruit held at the same temperature without exposure to CO_2. Initial carbon dioxide treatments at the temperatures that commonly prevail in a freshly loaded refrigerator car usually had as favorable an effect in retarding decay and in holding the firmness of the product as immediate storage at 32°F. Most of the products were exposed for 2 days to relatively high percentages of carbon dioxide without injury to flavor. A few failed to stand such prolonged treatment.

Cuthbert raspberries, for example, were not injured by exposure to 30 to 40 percent of carbon dioxide at the temperatures used for 29 hours, but developed an objectionable flavor when the treatment was extended to 48 hours. J. H. Hale peaches were not injured by 40 hours' exposure to 50 percent of carbon dioxide at 51°F., whereas Belle peaches showed a loss of flavor from the same treatment at the end of 24 hours. Treatments sometimes impaired the flavor of muskmelons and Honey Ball melons, but appeared to improve the flavor of Honey Dew melons.

Carbon dioxide retarded the ripening of tomatoes and also the development of certain types of decay, but tomatoes exposed to high percentages of carbon dioxide sometimes failed to ripen satisfactorily upon removal.

Eggplant, radish, romaine, peppers, Big Boston lettuce, and green bananas were injured by 2 days' exposure at an average temperature of 40° to 45°F. to atmospheres in which the carbon dioxide averaged 20 to 25 percent. Swiss chard, escarole, peas, and New Zealand spinach were not injured by this treatment, but were injured when similarly exposed to atmospheres in which the carbon dioxide averaged 50 percent.

Cabbage, Chinese cabbage, broccoli, cauliflower, kohlrabi, collards, spinach, turnips, beets, corn, Iceberg lettuce, ripe bananas, avocados and papayas were not injured by either of these treatments. The carbon dioxide seemed to decrease the bitterness in the Iceberg lettuce and to improve the flavor of the avocados and papayas. Celery was injured by 3 days' exposure to atmospheres in which the carbon dioxide averaged 50 percent.

ADMINISTRATIVE NOTES

Travel — It is always the NEWS LETTER'S endeavor to accomplish the greatest good for the greatest number--and it has been its observation that the greatest number is No. 1. So, this is a warning that travelers at Government expense can accomplish the greatest good for the greatest number by making sure that the transportation requests they issue actually cover the sort of transportation secured.

Transportation requests must be made out to show exactly the class of transportation--coach, Pullman, etc. If you are going from Washington, D.C. to Boston and travel in a sleeper to New York city and in a coach from New York city to Boston, the transportation request must show on its face "Pullman, Washington to New York City; coach from New York City to Boston." This notation will enable the railroad to issue the ticket with a coach coupon at reduced rate from New York city to Boston.

The General Accounting Office will not allow payments to be made to railroads in excess of the class of service actually obtained and it has been necessary for the Bureau's accounting officers to make a number of suspensions from vouchers because of the traveler's failure to obtain tickets corresponding to the class of travel.

Department Regulations — The new edition of the Regulations of the Department is being distributed. It will be kept up to date by revisions from time to time, and has been prepared with that in mind. The Secretary asks that employees read these regulations in the light of their effect on their own work and make suggestions as to additions, changes, etc. Suggestions, of course, should be sent to Dr. Auchter. When you receive your copy of the new edition, send your old copy to Mr. Gillette to guard against referring to the wrong copy. If you had a copy of the old regulations and have not received the new edition, take up the matter with your section leader.

Boards of Survey — Memorandum No. 699 of the Office of the Secretary appoints a Board of Survey whose duty it will be to dispose of all unserviceable or surplus property located in Washington, D.C. It will also handle field property where the value is in excess of $500. Disposition of wornout property at field stations and laboratories of the Division will be handled as in the past--by the appointment of members of the staff at the stations as boards of award. If such an appointment is for the disposal of material or equipment having a sales value, the appointment must state definitely what is to be sold, and the sales must be recorded on numbered sales slips provided in connection with the appointment. Such slips will not be necessary in connection with the disposal of worthless, broken or wornout equipment or materials.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

Vol. VIII Washington, D. C., September 1, 1936 No. 17

Visitor's Day at Greeley.

"We held our Annual Visitor's Day at the station on Friday, August 14," writes W. C. Edmundson from the Potato Experiment Station at Greeley, Colo. "A large number of growers attended the meeting. It was estimated that about 300 farmers attended the Annual Visitor's Day. A short program was given on the lawn before visiting the field plots.

"Mr. C. H. Metzger of the Colorado State College of Agriculture discussed 'Conditions of Potato Crops in Other Parts of the State.' Dr. Walter P. Raleigh discussed 'Potato Diseases.' and also gave a brief talk on potato growing in Maine. Dr. W. J. Zaumeyer gave a short talk on 'Bean Diseases and New Varieties.' Mr. L. Toyne, Weld County Agricultural Agent, discussed 'Control of Perennial Noxious Weeds.' Mr. L. B. Daniels of the Entomology Department of the Colorado State College of Agriculture, discussed 'Sprays and Spraying Methods of Control of Psyllids.' I gave a brief discussion of 'Seasonal Conditions as Affecting the Potato Crop in the Greeley District.'

"After the program, the field plots were visited and the experimental work was discussed. We had a very good exhibit of potato machinery which drew considerable attention. The Extension Division of the Colorado State College of Agriculture gave a demonstration of spreading poison bran mash very evenly for a distance of about one rod on each side of the machine."

He had written earlier that grasshoppers had been doing considerable damage to crops throughout the district and some damage at the station. He had been spreading poison mash and operating the hopper-dozer with the result that many bushels of grasshopper had been caught and a fairly good kill made with the poison.

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

Writing from the U. S. Pear Field Station on June 29th he said: "During the week, counting of the total number of fruits per tree on each of the three 'special study' trees in each of the Time of Irrigation and Pruning Irrigation plots was completed. These counts show that our Anjou trees are carrying from 17 to 32 percent fewer fruits than in 1935, and that the crop in such plots as Old Frequent is very much lighter than my casual observations had indicated. Although the ends of the limbs are sagging with a heavy load of fruit, the centers of the trees are almost devoid of fruits. I believe many growers in the Valley are being somewhat similarly misled by the large number of fruit on the ends of the limbs, and that such growers are therefore overestimating their 1936 crop of Anjou.

"Our counts of the average number of fruits per tree (based on 6 trees per plot) in Old Dry and in Old Frequent soil moisture plots during the past 5 years provide some very interesting data:

	1932	1933	1934	1935	1936	Total '32-'36
Old Dry	804	1297	451	897	735	4,418
Old Frequent	1007	1332	1033	1040	808	5,220

These soil moisture plots were started in the spring of 1932.

"I believe the 25 percent greater number of fruits in 1932 in Old Frequent than in Old Dry was due to the original bearing capacity of the trees rather than to the difference in soil moisture during the spring of 1932. With the exception of the very low number of fruits in Old Dry in 1934, the increased frequency of irrigation in Old Frequent plot to prevent serious water deficiencies in the trees has not significantly increased either the bearing capacity in 1936 or the total number of fruits produced per tree during the five years. Other data show the trees in Old Frequent to have a much greater length and diameter of branch growth and more fruit-buds per tree than Old Dry. However, the above fruit counts rather indicate that preventing serious water deficiencies in the trees by more frequent irrigation has not increased the capacity of Anjou trees in a clay adobe soil to set and hold more fruit. These data, therefore, lead me to the conclusion that the solution of the problem of increasing the set of Anjou trees in heavy soils does not lie in improved soil moisture conditions. This conclusion is further emphasized by the further data for these plots, shown on the following page:

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg. (continued)

	Leaf area per fruit 1935.	Tree response in 1936 Total number of Fruit buds per tree.	Percent of Blossoms Setting fruit.	Total No. fruits per tree.
Old Dry	975 sq.cm.	5,199	1.8%	735
Old Frequent ..	1,582 sq.cm.	6,840	1.5%	808

"I am very much surprised that the much greater leaf area per fruit in Old Frequent in 1935 than Old Dry did not result in the greater set of fruit in Old Frequent in 1936."

FLORICULTURAL AND ORNAMENTAL HORTICULTURAL PLANT INVESTIGATIONS.

Frank P. McWhorter, Corvallis, Oreg.

"Through the medium of Stain Technology, I can now write on my brochures presenting 'Possible uses of dioxan in botanical technique', the uncertain salutation--cum grano salis," he writes to Dr. Emsweller under date of July 30th. "This dioxan technique has justly earned me many vexed fellow employees because the number of inquiries about the methods has surpassed my dictaphone's capacity. Separates are obtainable. Now new applications are in sight--this time for fungus spores. The story of spore germination can be rewritten. A new tool is available for elucidating the behavior of every day spores--those 'imperfects' which the fighting pathologists must encounter as they war against blights.

Cum grano Salis.

"The new application shows that as the germ tube forms a centrosome moves from the periphery of the nucleus into the germ tube. It seems to pull the chromosomes after it. Yes, one can see the chromosomes. At 4000x they are as large as fly specks. Question: In these every day fungi, where changes, strains, variants, etc. are the rule, are the chromosome numbers constant as we would like for them to be? I fear not. I have made counts. Fungus strain-variations disqualify (host) resistant-varieties. Perhaps this new technique will permit cytological differentiation of strain discrepancies and show their origin. I have used it to prove specific differences between related fungus species. The second technique paper has been written.....A photograph of fungus chromosomes (for which I propose the term chromatin units) was sent to our office so that everybody will not call me a liar!"

DECIDUOUS FRUIT INVESTIGATIONS

Leslie Pierce, Vincennes, Ind.

"July was the hottest month that has occurred in the 12 years that temperature records have been kept at this laboratory," he writes from the Fruit Disease Laboratory on July 31. "The mean maximum temperature for the period from July 5 to 15 was 106.9°F. During this 11-day period the following daily maximum temperatures were recorded: 105, 107, 106, 106, 102, 105, 105, 110, 110, 110 and 110°F. The mean maximum for the month was 97.9 or an average daily excess above normal of 6.8 degrees. The accumulated excess above normal for the month was 204.6 degrees. The precipitation for July was 2.23 inches, a departure from normal of -1.37 inches. The accumulated deficiency in rainfall since January 1 has now reached a total of 14.4 inches.

"In spite of the moderately favorable moisture condition which prevailed during July, the excessive heat caused severe damage to growing crops. In some fields the cantaloup crop was harvested in one week and the market value of the melons was greatly reduced by sunburn. The loss from heat injury to the cantaloup crop in Gibson county is estimated 50-60 percent and at 25 percent in Kox county. After the first three pickings had been made, early tomatoes were so severely sunburned that the remainder of the crop had practically no market value. A rain of 1.03 inches which fell the night of July 24 has apparently saved the crop of late canning tomatoes.

"The harvest of the Duchess apple crop was commenced about midway of the period of highest temperatures. Sunburn and internal breakdown caused by the extreme heat so severely damaged 50 percent of the crop that it was unfit for market. On account of the small size and poor quality the bulk of the Duchess apples in this section sold at prices ranging from 65 down to 35 cents per bushel. Fall and winter varieties of apples came through the hot spell in remarkably good condition. Aside from a small amount of sun injury showing on the fruit on the southwest side of the trees and a slight reduction in size in the case of Grimes, the crop of late apples has apparently suffered no injury from the extreme heat.

Henry F. Bain, Wisconsin Rapids, Wis.

"The season has advanced enough to get a better line on the effect of heat during setting of the crop," he writes from the U. S. Cranberry Laboratory on August 8th. "The State and Sales Co. representatives now estimate about 25 percent reduction below earlier prospects. Reservoirs are drying up rapidly so that the frost hazard is becoming serious. Marshes short of water will undoubtedly be harvested earlier than is desirable and this may reduce the crop still more as well as give us some berries of inferior quality....Wisconsin Rapids had a shower of about 1/2-inch yesterday, but the main cranberry district 10 miles west of us had practically no rain from it."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"On Tuesday and Wednesday, July 28 and 29, a trip was made in company with Dr. Darrow and Dr. Zeller to the Hood River Valley where considerable time was spent in going over strawberry selections being tested by the Hood River Experiment Station," he writes in the report for July 27 to August 1.

"Particular attention was paid to examining the different selections for presence of virus diseases and cyclamen mite. Considerable attention was also given to studying plants which have been given the hot water treatment for the control of cyclamen mite. It appears that the hot water treatment is a practical method for the control of this insect. Nearly all strawberries planted in the Hood River Valley this year were given that treatment (599,100 Improved Clark (Ulrich), 240,300 Redheart, 16,600 Adkins and 10,000 Dorsett).

"There was some variation noted in the vigor of plants so treated. On questioning the methods used, it was learned that some losses occurred where care had not been taken to cool the plants after the treatments. In a few instances plants were found infested with mite which had been treated. However, it took considerable searching to find such plants."

He had written earlier: "On July 15-18 a trip was made to Puyallup, Wash. where detailed studies were made of the small fruit breeding work of the western Washington Experiment Station, particularly the work on red raspberries, being continued by Dr. C. D. Schwartze and Dr. Huber. They are paying particular attention to the breeding for hardiness in red raspberries and testing these seedlings for their susceptibility or resistance to virus diseases....

"Saturday on the way to Corvallis a stop was made at Gresham, Oreg. to visit the Gresham Berry Growers' plant. A number of growers in the vicinity of Gresham are growing the Brainerd blackberry. The Gresham growers are finding that it makes a very excellent canned product when put up with syrup, but is not suitable for the water pack. They are making a rather thorough test of the commercial uses of the Boysen berry and the Youngberry."

He mentioned, also a stop at the Blueberry Nursery of Mr. Joseph Eberhardt, Olympia, Wash. Dr. Eberhardt is doing considerable breeding work with the blueberry and has some seedlings of remarkable size. He has succeeded in propagating the blueberry rather inexpensively. At Rowell Brothers farm near Scholls, Oreg. he found a large acreage of Cuthbert raspberries and over 50 acres of Youngberries.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"The first car of grapes was shipped from Springdale on July 29. I was talking with a number of grape growers during the early part of August and they felt that unless rain arrived in the immediate future the quality of the later maturing grapes would be decidedly impaired. I was very much interested too, in view of the dry season, to note that the peach leaves in one of the Ruppel Brothers orchards showed a very decided spotting and shot-hole effect due to Bact. pruni when examined July 29. Bacteria oozed from the spots when fragments of the diseased tissues were dropped in water....Professor Isely estimated that some 20,000 acres of corn and other forage crops were damaged by grasshoppers in Benton county. The corn in this area was completely destroyed, even the small ears being eaten by the grasshoppers."

H. F. Bergman, East Wareham, Mass.

"The first samples of leaves from sprayed plots after the completion of the season's spraying were collected this week," he writes from the Cranberry Disease Field Laboratory on August 8th. "This set of samples will give us better evidence of the persistence of spray coatings as there have been some rains recently to wash off some of the residue. There are marked differences in the amount of visible residue with different spray treatments. Leaves of vines on all plots that have been sprayed with bordeaux are plainly darker green than those of unsprayed vines. Under some conditions this can be seen from some distance..... Rot is beginning to appear on the berries on a few bogs. They are showing up earlier this year than last. Present indications are that the cranberry crop this year will be fair to poor in keeping quality."

Howard E. Parson, Shreveport, La.

Writing on July 18th he says: "On Stuart trees in the Webb orchard there is at least 50 percent less downy spot on sprayed trees than on unsprayed trees. The reduction in this amount of downyspot is even greater on trees receiving two early applications of spray. There is also over 50 percent less downy spot on Stuart trees in an adjoining alfalfa patch than on trees in the check plots. No other factor than sanitation is known which will explain this. The orchard was harrowed early in the spring and this stirred up inoculum just at a critical time for infection to take place. The alfalfa probably has also operated as a trap for inoculum. In the Fullilove orchard there is 85 percent less downyspot on sprayed trees than on unsprayed trees. The amount on the check trees is slightly less than on check trees in the Webb orchard. Oil emulsion was added to the one early spray that was made whereas none was available for early spraying in the Webb orchard. It cannot be definitely said whether the incorporation of oil is responsible for this big difference in the control of downyspot in the two orchards."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Geo. P. Hoffman

"The Glovel tomato is showing up unusually well," he reports for the week ending August 8th, "and apparently promises to be well adapted to this section."

He has written earlier: "Apparently crotalaria is still our most promising summer cover crop for bearing pecan groves in this section. However, unfavorable growing weather such as has been in this section this summer has resulted in poor stands generally.

Dr. L. A. Fletcher - small fruits.

"The Carman variety of grapes was harvested," he reports for the week ending August 15th, "giving a yield of over 450 pounds from 42 vines. Again it was noted that apparently rootstocks had shown a difference in size of berry and cluster, compactness of cluster (very marked) and maturity. A portion of the Beacon variety was harvested. This variety showed very severe cracking."

He had reported August 8th: "The Concord variety was harvested and showed quite a difference in maturity on various rootstocks. Other differences which were noted on the various rootstocks were size of berry, size of cluster, and uneveness of ripening of berries."

J. M. Lutz - fruit and vegetable handling and utilization.

He comments, too, on the influence of the various rootstocks on the growth and vigor of Concord grapes. "The resultant influence on the quality and composition of the fruit is proving to be of considerable importance," he adds.

He had written earlier: "A large share of the week ending August 1 was spent in determining the composition of the Labrusca grapes grown at the station. The purpose of this work is four-fold: (1) to aid in evaluating quality for various purposes of the different varieties; (2) to determine the influence of maturity on the composition of grapes; (3) to attempt to develop a maturity index; and (4) to compare the composition and quality of grapes ripening at high atmospheric temperatures as compared to similar grapes ripened further north under cooler conditions. The old axiom that it requires cool nights to produce Labrusca grapes with high sugar content does not seem to hold here this year. Three varieties have thus far shown over 20 percent soluble solids, namely--Delaware, Mericadel and Bacchus."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"During the past week an increasing drop of nuts has been noted," he writes from the U. S. Pecan Field Station and Laboratory on August 15. "In practically all instances it is possible to find one or more shuck worm or stink bug punctures in the dropped nuts and these two insects are without doubt the cause of the nuts dropping. Of the two, the shuck worm punctures are much in the majority. Unless the shells harden in the very near future the loss of nuts at this time may be very serious. I have noted that the shells of Stuart nuts are partially hard and in one orchard the hardening appeared almost complete. The shells of Schley nuts are just beginning to harden.....

"The weather for the week was again 'slightly' unsettled, running the gamut from hot sultry days to days bringing heavy rains. An additional three inches of rain fell at Philema. This of course did not include about two inches of rain which missed Philema by a very short distance. The rainfall for the last thirty-five days has totaled almost exactly 14 inches or a little less than one-half inch a day on the average. The growth in size of the nuts has been stimulated but so also has the pecan scab and unsprayed trees of scab susceptible varieties are likely to show a reduced yield as a result.

He had written August 8th: "The drop records show that there was almost no drop during the past two weeks. The small drop which is occurring, coupled with the increasing size of the nuts and consequent increased ease of observation, will no doubt lead to an almost daily increase in the estimate of the crop in this section of the Southeast.

"Crop estimates from other sections of the Southeast are also being increased. The pecan producing areas west of Alabama are still reporting a very small crop and as a result the paper shell pecan producers are becoming very optimistic. It is of course too early yet to predict the quality of the nuts but unless growing conditions are materially altered at least the number and size of the nuts, and probably the price, should be very good. The nuts on the trees in the station orchards are beginning to show up to a larger extent than previously thought and we expect very little reduction and possibly an increase in total yield over the 1935 crop."

During the first part of July history repeated itself when many Schley trees in the Albany section lost a large percentage of their crop. The rains were general and heavy with some accompanying wind and within two or three days the Schley trees had lost up to almost 100 percent of their crop. In one section where the Schley dropped the heaviest, trees of the Moore variety standing adjacent lost not over 5 percent. This was true also of the Stuart.

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"Most of the time during the past two weeks has been taken up with evaluating nuts from the breeding tracts and in harvesting the new crop," he writes August 8th. "Owing to the frost, the new crop will be light from most of the crosses. However, it appears that it will be possible to obtain some nuts from about 1,000 of the hybrid trees.

"The crows at the present time are very numerous and undoubtedly will do considerable damage. They appear to be even worse than last year and because of their number we decided to cover the crosses made last year. As the expense of covering a large number of trees in the breeding tracts would be prohibitive, we are taking a chance with the crows and hope to beat them to the harvesting--or at least get some samples."

J. R. Cole, Albany, Ga.

"A very unusual condition has developed as far as scab infections are concerned," he writes from the U. S. Pecan Disease Laboratory on August 8th. "During the early spring, April and the first part of May, we had ideal scab weather and the scab infections resulted before we could make the first prepollination spray application. Then we had almost three months of dry weather with just enough scab to get primary infection on a few nuts. Then about the middle of July, or the 11th, to be exact, it began raining late in the afternoon giving ideal scab infection period. This resulted in secondary infections on the nuts and although I have been unable to get scab infection counts it will not be a very difficult matter since the nuts on the check trees are black with scab infection and on some of the experiment plots they are also affected by this disease. We will be able to eliminate more spray combinations which apple and peach growers have used successfully to control diseases of these two fruits. It just looks that we will be unable to get away from bordeaux mixture and the 2-1/2-50 bordeaux plus summer oil emulsion is giving the best results at this time."

Paul W. Miller, Corvallis, Oreg.

"The results of cross inoculation studies were the most interesting feature of the data taken during the week. In these studies lesions on young filbert nuts were produced by spraying on pure water suspensions of Phytomonas juglandis (the walnut blight pathogene) and placing in a saturated atmosphere for 72 hours," he writes August 1. "The lesions were confined to the shell for the most part, seldom penetrating more than 1/2 mm deep into the shell. Results of these cross inoculation studies are another link in the chain of evidence supporting the view that walnut bacteriosis and filbert blight are caused by closely related organisms."

NUT INVESTIGATIONS

Paul W. Miller (continued)

"The week ending August 8 was spent in western Washington on a series of nut tours in Whatcom, Skagit, Snohomish, Lewis, Clark and Skamania counties, respectively.

"In Whatcom county, the DuChilly variety of filbert seems to be doing better than the Barcelona variety, making a better growth and yielding larger crops. This variety also escaped serious damage from the freeze which occurred in October 1935, while the Barcelona variety was badly injured in some sections of the county. For example, in one mixed 6-year-old planting of Barcelona and DuChilly filberts located near Everson, Wash., a number of Barcelona filbert trees were found badly injured, some so severely so that they will probably die, while the DuChilly was not injured to any appreciable extent, if at all....

"An epidemic of walnut bacteriosis was found in walnut orchards in Lewis County, Wash. It is estimated that about half of the Washington walnut crop will be lost from blight this season...."

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

"The potato crop in Aroostook County, though somewhat late, is in excellent condition except for some fields on which a poor stand was obtained. Most of the fields have been sprayed or dusted as a protection against late blight. This disease has made its appearance in a few fields but it has not spread sufficiently to cause much damage. It is reported that the Woodman Potato Company has made arrangements to have 800 acres dusted by airplane. A demonstration of this method was given at Washburn July 25th.

"Tuesday and Wednesday, July 14 and 15, the writer attended the meeting of the Canadian Society of Technical Agriculturists which was held at Fredericton, New Brunswick. Later in the week members of the Canadian Phytopathological Society came to Presque Isle and looked over the work which is in progress at Aroostook Farm. Mr. Davis, Dominion Horticulturist, and Dr. Swaine, Dominion Director of Research, have also visited the station.

"The experimental plots have been sprayed and rogued during the past week," he writes July 25th. "It is expected that the hybridization work will be started the first of next week."

ROOF-GARDEN GREENHOUSE HANDY FOR RESEARCH MEN

"An experimental greenhouse--seven floors above the street level--on the South Building of the United States Department of Agriculture at Washington will be used for the first time this fall," says a press release of August 16th. "The greenhouse will be the workshop of plant specialists in the Bureau of Plant Industry and will supplement research in laboratories at Arlington Farm across the Potomac in Virginia and at the National Agricultural Research Center, Beltsville, Md.

"This scientific center has the advantage of convenience--the plant specialists have their offices on the floors below--and, strange as it may seem, is not so expensive as a greenhouse on the ground nearby would have been. All land close at hand is occupied by business houses or by Government buildings or parks, and is too valuable to be occupied only by a greenhouse.

"This greenhouse in the air is approximately 30 feet long and 26 feet wide, and consists of 14 units. Studies in plant physiology, breeding, and disease resistance which need constant attention of investigators will be carried on there."

Rubber Stamps — Rubber stamps are made in practically any size or style of type at the Mechanical Shops (Rubber Stamp Factory), Washington, D. C. If you wish any rubber stamps made, and time will permit awaiting their arrival from Washington, orders may be sent to Ray Jones of our Business Office, who will see that the stamps are secured promptly. Send along with your order the exact lettering to be used on the stamps and indicate by sample or otherwise the size and style of type desired. This lettering and type sample should be on a sheet separate from the order and must be submitted in duplicate.

Bills of Lading. — New form Bills of Lading have recently been printed and are now available. These are practically the same as the forms we have been using except that they bear these statements on the face: "Pick-up service at origin was (was not) by the Government," "Pick-up service at destination was (was not) by the Government." These statements must be signed by the issuing officer and consignee respectively.

If you have bills of lading on hand that do not have these statements printed on them, please see that the statements are typed or stamped on before issuing or the accounting office will be sending them back for this information.

And DO NOT FORGET to fill out the "Certificate of Issuing Officer."

ADMINISTRATIVE NOTES

Travel This matter of getting travelers to indicate clearly on their transportation requests the exact sort of transportation secured appears to be like a straphangers' petition--a complaint of long standing. At least immediately following the little note on the subject on page 193 of the August 15th News Letter we received Budget and Finance Circular 30, which is quoted below:

"The attention of all officers and employees of the Department traveling on official business is directed to the necessity of indicating on transportation requests whether the transportation facilities furnished by the railroad company are of the first class at the prevailing rate for such accommodations or of the coach service class at the lower rate applicable thereto. Prior to June 1, 1936, such a difference in rates prevailed only in Western and Southeastern passenger territories, but since that date it has become effective also in Central, Trunk Line and New England passenger territories. A first class ticket at the higher rate is required in connection with the use of Pullman accommodations.

Paragraph 13 of the Standardized Government Travel Regulations provides that "the following accommodations will be allowed on trains * * * * * (a) One standard lower berth for each person * * * * * (b) One seat in a sleeping, parlor, or chair car, when journey is more than 25 miles. If journey is less than 25 miles the necessity for the seat must be shown". These provisions make it necessary to use coach service, at the reduced rate, for journeys of 25 miles or less, except when the only available train carries all-Pullman equipment, in which event this must be explained in the travel account.

Paragraph 21 of the Standardized Government Travel Regulations provides that in preparing transportation requests "The date, place at which request is issued, the name of the carrier or company on which drawn, point of departure, destination, complete route, showing initials of carrier and junction points when necessary, class of ticket, whether first-class, limited, round trip, party, or other special class, must be inserted". On the face of the Transportation Request form a block is provided wherein the class of service requested and received is to be indicated. If first class ticket is obtained in exchange for the transportation request the word "first" should be inserted in this space; but if the ticket obtained is at the lower rate entitling the traveler only to coach accommodation, the word "coach" should be inserted, instead. In some cases a traveler may find that first class service is available for only a portion of the journey, with only coach service available beyond a certain junction point. This type of service is commonly called "mixed" class. When it is used the word "mixed" should be inserted in the class block on the face of the transportation request and a notation should be made on the reverse side of the request form stating precisely the class of service furnished between points enroute of travel, so that when the request is presented with the carrier's bill, the correctness of the charges may be verified from this information."

ADMINISTRATIVE NOTES

Airplane Travel. Once upon a time there was a post office clerk who happened to turn over the postcard he was reading--and found it was addressed to him. Well, this is addressed to you, if you perform travel by airplane. A decision from the Comptroller General's office under date of June 30, establishes a precedent to be followed in determining the salary saving to be allowed in comparing airplane travel with that by rail or steamer plus Pullman, etc.

In the example used, the traveler included Saturday afternoon and Sunday in the comparison but the Comptroller points out that the benefit to the Government is to be measured by "the amount of the salary of the traveler for the time thus saved." Clearly, he says, there is no such benefit and no time saved for Sundays, holidays or Saturday afternoons. The traveler by using airplane returned to his official station Thursday evening instead of Sunday evening. He was thus available for duty on Friday and Saturday morning--1-1/2 days. But the Comptroller assumes that no official duty was required Saturday afternoon or Sunday, this 1-1/2 day representing no saving within the contemplation of the regulation. So the voucher was passed for 1-1/2 days credit instead of the 3 days claimed. In considering airplane travel, then, remember that the time saved means time saved for Uncle Sam--not you.

Telephone Contracts It was noted when the new telephone contracts were submitted for the fiscal year 1937 that a great many of them did not show telephone listing. Some still carried the listing "Office of Horticulture," or other listing used in past years before the name of the Division was changed. Now is the time to check up on your telephone listings before the next issues of directories are printed.

All Government telephones must be listed under the standard heading "United States Government," followed by "Bureau of Plant Industry," "Division of Fruit and Vegetable Crops and Diseases," or the correct designation of your field station--whichever you think will be most readily recognized in your particular locality. For example, an approved listing might be "United States Government, Bureau of Plant Industry, Horticultural Field Station" (using the designation given in the 1936 Directory of Activities of the Bureau of Plant Industry, but dropping the words "United States" since these are used in the first line of the listing). We understand that where there is an additional listing under an individual's name, he personally assumes the expense for this.

Next year telephone contracts may be drawn up for an indefinite period, so we are anxious that the listings be corrected and standardized before the new contracts go into effect.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

John A. Ferrall, Editor

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Potatoes--and haircuts

A stranger entered a barber shop with a little boy and had a haircut, shave and shampoo. Then he announced that he was going across the street for some cigarettes and would be right back. "In the meantime," he told the barber, "you can give the lad a haircut." After something more than a half hour the barber became uneasy. "Your father is a long time coming back," he said. The boy got out of the chair, his hair nicely cut and combed. "Oh, he isn't my father," he explained. "He just stopped me on the street and asked me if I wanted a free haircut."

There are lots of schemes for getting something for nothing, some of them successful, but the top of the ladder is occupied by research. As a dividend payer it is in a class by itself. A few weeks ago Dr. W.H. Martin, director of research for the New Jersey Agricultural Experiment Station, told a gathering of horticulturists that the value of increased potato yields that Jersey growers obtained this year through applying the findings of farm research exceeded the appropriation for the Station during the year. He pointed out that potato yields during the last 10 years have averaged 62 percent higher than during the period from 1900 to 1909, an increase made possible by research. Which, of course, just naturally leads up to the Katahdin potato, a seedling variety originated by Dr. Charles F. Clark back in 1923 by crossing two other seedlings whose parentage traced back to the commercial varieties known as Rural New Yorker, Busola, Aroostook Wonder and Sutton's Flourball. This seedling was one of the several developed for resistance to virus diseases. Its commercial success has led to the prophesy that it will return to the American potato growers more than the total cost of all potato investigations since the Department was established.

In Michigan, for example, the Katahdin has already reached sufficient commercial importance to lead to the publication of Special Bulletin No. 271, "The Katahdin Potato in Michigan," by the State station. Its authors, H. C. Moore and E. J. Wheeler, report that the new variety has proved well adapted to most sections of Michigan, producing table stock of good market quality. It develops tubers of good type under hot, dry conditions that often prove unfavorable to the Russet Rural in Michigan, they point out.

Indications of its excellent cooking quality were given by a test made in the fall of 1935, when the writers placed 53 bushels of Katahdin potatoes with 53 of the leading hotels of Michigan, Ohio, Illinois and Indiana for critical cooking tests. No less than 39 of these hotels reported that they found the Katahdin excellent for baking, boiling and frying, and they were well pleased with the color and texture of the cooked product.

Many of the hotel chefs made favorable comments on the attractive appearance of the Katahdin and were pleased with its smooth, thin skin and shallow eyes--which reduce waste in peeling.

"An outstanding characteristic of the Katahdin that should appeal to most Michigan Growers," says the bulletin, "is its ability to produce satisfactory yields of good type tubers even under heat and drought conditions....

"Based on the information obtained in the fall of 1935 on a few hundred bushels of Katahdins marketed in Grand Rapids and Detroit, there is some evidence that when properly grown and graded it may surpass the Russet Rural in market preference. Approximately 1,500 bushels of Katahdin grown at Lake City were sold in Grand Rapids at a premium of 18 cents per bushel over Russet Rural.

"Another Katahdin lot of 300 bushels was marketed in Detroit in November, 1935, and sold for $1.50 per hundred for U. S. No. 1 grade and $1.70 per hundred for U. S. Fancy Grade. Michigan Green Mountains of similar grades sold at the same time for the same price. Russet Rurals carefully graded U. S. No. 1 and U. S. Fancy brought $1.25 and $1.35 per hundred for the respective grades. At the time of this special sale ordinary Michigan Russet Rurals, U. S. No. 1, were selling for $1.15 per hundred. The reports received from several growers who have marketed Katahdins show that it has so far met with considerable favor."

When planted in April or May for the August and September market, the bulletin reports, the Katahdin generally exceeded the Irish Cobbler in yield of marketable potatoes.

NUT INVESTIGATIONS

"What appears to be a genetic point of considerable importance to future filbert planters of the East has developed during the past season in my back yard at Takoma Park, Md.," writes C. A. Reed. "It is an entirely natural development, wholly unassisted by artificial interference. A Rush seedling hazel grown from a nut naturally pollinated by a Barcelona filbert appears to have effectively pollinated the pistillate flowers of the Barcelona tree. For the first time since being transplanted to its present location the tree bore a full crop and the nuts were largely well filled.

"This point becomes of unusual interest when it is remembered that the Barcelona, like all other varieties of European filbert, is completely sterile to both its own pollen and that of the native species of Corylus americana, to which the Rush belongs. Stated succintly, an F_1 generation of Rush x Barcelona appears to have pollinated the flowers of its staminate parent.

"When the Barcelona tree was set out in April of 1912, a Rush tree was set near it. The latter soon began to bear and for a number of years fruited regularly and well. Then it ceased bearing altogether and was presently removed, but not until after its seeds had been planted all about the neighborhood by squirrels. Most of the young trees were removed as fast as they appeared, as the majority came up where trees were not wanted. Only four still remain. These are quite near the Barcelona tree.

"Ordinarily the Barcelona is one of the earliest of European varieties to come into bloom. Year after year, with few exceptions, since it first began to blossom, both staminate and pistillate flowers have been observed in full bloom on the first warm sunshiny days after Thanksgiving. With lower temperatures these disappeared, but others would appear when the sun again became warm enough for a few hours. By the end of January or, at latest, by the middle of February, the season for Barcelona would be over. The natives and most varieties of Europeans bloomed later. At about midsummer a few clusters of nuts would appear on the Barcelona tree, but these would all be blanks and would mostly drop before the normal time for ripening. This year's crop - as already stated - was not only very large but the kernels were mostly plump and well filled.

"The cold weather of 1935-1936 began unusually early and as a result the Barcelona flowers were held back until March and so blossomed with the natives and most other European varieties. However, there were no other filberts of any kind in the neighborhood except the Rush seedlings, which show by their leaf growth characteristics to be hybrids.

"This phenomenon may not occur again soon as the Barcelona will doubtless blossom at its normal period, which will be well in advance of its offspring, but there will doubtless be an occasional year when the two periods will overlap to some extent. In fact, one year ago, the Barcelona tree matured a small number of well filled nuts which were then not explained."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on August 22, he says: "It may be of some interest to note that at the meetings of the Southern Agricultural Workers Society the whole trend of the talks was toward more extensive livestock production. This same trend has been noted all over the Southeast and in time may have some influence on the pecan industry. One of the faults in the organization of the pecan industry has been its extreme concentration, eliminating any other farming enterprise. It is hoped that with more emphasis being placed on livestock it will not be so difficult to convince growers of the necessity of thinning the stand of trees, since such an operation would allow them to grow some crop suitable for cattle feed, the trees benefiting both from the additional space and the manure obtained.

"The present growing season has apparently been favorable for the propagation of the black aphids since we are beginning to get some reports that they are showing up in some areas. At Philema we are finding them fairly well scattered although much more numerous in some areas than in others. They are also more numerous on Schley trees than on Stuart trees even though both received the same spray and are adjacent."

Paul W. Miller, Corvallis, Oreg. (Prune Russet)

"Studies on the relative amount of russet in variously situated orchards in the Williamette valley were carried on during the week," he writes for the week ending August 22.

"The results of these studies give still further support to the view that mechanical injury incident to the rubbing of the young fruits against twigs, leaves, etc. during windy periods in the spring is a very important factor in the development of the type of russet which results in economic loss. In general, the amount of russet found in the various orchards studied was inversely proportional to the degree of protection from the prevailing winds. Those orchards which are exposed the most to the prevailing winds had the greatest amount of russet. Thus, of all the orchards visited during the week the planting which contained the greatest amount of badly russetted fruit was located near Stevenson, Wash. on top of a hill on the north side of the Columbia Gorge. Sixty-two percent of the prunes examined in this orchard were found badly affected with russet. This orchard is located on one of the windiest spots in the whole Pacific Northwest.

"Conversely, those orchards which had the greatest amount of protection from the prevailing winds either by virture of the neighboring hills or timber or both had the least amount of russet."

NUT INVESTIGATIONS

Paul W. Miller (continued)

"The forepart of the week was spent in further prune russet studies," he reports for the week ending August 29th.

"Results of these studies give additional support to the view that the type of russet which results in economic loss is caused chiefly by mechanical injury associated with the rubbing of the fruits during and shortly after the shuck fall stage against twigs, leaves, etc.

"That mechanical injury can indeed cause prune russet was definitely shown by the results of current studies taken during the week in which an effort was made to reproduce the disorder experimentally. In these studies bagged prunes at and shortly after the shuck fall stage of development were rubbed with stems of small twigs. Practically all prunes so treated now contain large russetted areas in the regions where the fruits were rubbed.

"There is some evidence to indicate that the feeding of thrips may result in small russetted areas, as evidenced by the fact that some of the fruits in bags into which thrips had been introduced earlier in the season now contain small russetted areas mostly at the apical end. However, in no case were the russetted areas of sufficient size to warrant rejection of the fruit as culls. In fact, in most instances, the russetted areas on these fruits would not be noticeable after the fruit has been dried.

B. G. Sitton, Shreveport, La.

Writing from the U. S. Pecan Field Station at Shreveport on August 22d, but reporting on work at Robson, La., he says: "During the week a survey of the effects of the drought on forest trees in this neighborhood was made by the Forest Service. In the hills it was found that many oaks, both young and old, are dying because of the drought. Injury seems to be worse on ridges and on sandy soils. The situation looks serious unless we get a good rain soon. Hickories and pecans seem to be withstanding the drought fairly well."

Milo N. Wood, Sacramento, Calif.

"All told, we will collect small samples from some thousand hybrid trees provided we can continue to keep slightly ahead of the crows," he writes for the week ending August 25. "We find that we have to be quite prompt in picking the nuts to get any at all and even then the crows sometimes get most of them. I think that the crows, blackbirds and linnets have been much worse this year than last."

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J. M. Lutz (fruit and vegetable handling and utilization)

"The analyses of the fresh grape juices have been completed," he reports for the week ending August 29th. "It has been rather surprising to find that there was generally little change in the sugar content of grapes after they reached the market ripe stage. In some cases there was actually a decrease. Apparently, with grapes ripening under these high temperatures loss of sugar by respiration is greater than the gain by photosynthetic activity. There was nearly always a decreased acidity with advanced maturity, however, so that the solids-acid ratio decreased."

Writing on August 22d he said: "Together with Dr. Boswell a trip was made to the Sweet Potato Starch Plant at Laurel, Miss. on August 18 and 19. They expect to handle about 75,000 bushels this year. One of the big problems which apparently will have to be overcome to place sweetpotato starch manufacture on a commercially paying basis is to prolong the manufacturing season. The low price of the product does not warrant the construction of expensive storage facilities. They are trying to get growers to plant sweetpotatoes early so that harvesting can begin early. They are also trying to induce growers to store their own potatoes on the farm and devise cheap methods of holding sweetpotatoes. The Meridian Station plans to continue to conduct experimental work on this problem."

L. A. Fletcher (small fruits)

"The entire week ending August 22 was spent in harvesting grapes of the Labrusca species. A number of varieties were harvested, including Champanel, Beacon, Caco and Lenoir. The harvest of the Caco variety was limited to those vines of a southern source which were one week later in maturing their fruits than the vines from a northern source. The Lenoir variety (planted on various rootstocks) showed little or no difference between rootstocks. One vine on its own roots yielded 40 pounds. The average yield per vine for this variety was around 26 pounds. The variety has attracted much attention in this section."

Atherton C. Gossard (nut fruits).

"Notes were taken on the chemical test plots in the pecan orchard," he writes August 29th. "There were two outstanding points of interest noted during the observation: All of the plots which received boron as a soil application (1 pound per tree) show an interveinal burning in the form of brown pencil point spots beginning about midway between the midrib and the edge of the leaf and continuing toward the edge. These spots increase

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Atherton C. Gossard (continued)

in both density of numbers and intensity toward the margins until the leaf presents a solid brown margin, the very edge often being so badly burned as to be crisp and greyish. This burning appears on no trees except those which receive borax (1 pound each of sodium borate) applied to the soil beneath the tree, in the manner of fertilizer. The 8 small trees in the nursery which received varying amounts of borax from 1/4 to 1 pound and the buffer trees between them, show the same effects. It is now believed that this boron burning began to show up several weeks ago but could not then be definitely distinguished from the leaf burn described in early July. The two types are now clearly distinct, however.

"The other outstanding observation was that the trees which received two applications of 1-1-50 zinc copper spray have foliage of so much deeper and brighter a green as to be distinctly noticeable."

NUT INVESTIGATIONS

Howard E. Parson, Shreveport, La.

Writing from the U. S. Pecan Disease Field Laboratory on August 29, he reports that the data indicates for downy spot that there has been a decided reduction in the disease due to spraying; a decided increase in the prevalence of the disease in one month; considerably more downy spot near the ground than higher in the trees; two early applications of bordeaux mixture aids in controlling the disease more than only one; bordeaux mixture containing oil controls the disease better than bordeaux mixture containing no oil comparing 2-1/2-50 plus oil with 3-3-50 without oil; and that increasing the copper content from 2 pounds to 50 gallons to 4 pounds to 50 gallons even though oil is incorporated with the spray does not seem to better the control effected.

The data indicates for vein spot that there is approximately half as much vein spot on sprayed trees as on unsprayed trees; that there is no significant difference in the amount of vein spot low and high in the tree; and that on trees receiving two early applications it appears that increasing the copper content to 4 pounds to 50 gallons increases the effectiveness of the spray over 2 pounds to 50 gallons.

J. R. Cole, Albany, Ga.

"There is considerable interest on the part of growers in our spray experiments this year," he writes. "One grower, when observing our results in a nearby orchard said: 'I have been skeptical of the recommendations given by the Federal and State workers for insect and disease control, but it looks as though it will pay the pecan grower to spray for scab control.'"

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

"Commercial picking of Howell, Anjou and Bosc varieties started during the week," he writes from the U. S. Pear Field Station on August 24. "This season most of the Bosc will be packed as one grade, U. S. No. 1; since 1935 one shipper found the average price for this one grade to be a little higher than the average of prices for Oregon Fancy and Extra Fancy. Auction prices for Bartletts have continued to be fairly high with the result that Bartletts reaching the market the last few weeks will return to the grower between $0.80 and $1.10 per box.

"The second picking of Bartletts at the Medford Experiment Station was made on August 24th. The following figures for Bartlett production in field lugs on the same trees at the Medford Experiment Station during the past five years are of interest:

	1932	1933	1934	1935	1936
First picking	410	700	629	611	1101
Second picking	---	42	340	315	285
Total	410	742	969	926	1386

"I believe the principal reasons for the increased production are (1) effective blight eradication, and (2) lighter, annual, dormant pruning.

"Thursday was spent visiting Bosc and Bartlett orchards in the Placerville district of California in the company of A. H. Hendrickson. I was particularly impressed with the heavy crop of Bosc, with fairly large fruit in spite of considerable leaf injury by two-spotted mite. It seemed that the larger number of fruits per tree for Bosc of that district was largely due to the practice of relatively light pruning. Bosc in that district, however, are not popular for there is a tendency there for topworking Bosc to Bartlett. The first picking of Bartlett there had just been completed. The second picking would be light and would be completed in ten days."

About 5,000 cars of packed Bartletts are expected out of California this season.

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg. (continued)

"General reports from California and a letter from C. P. Harley, Wenatchee, Wash., show that these districts, as well as the Rogue River Valley, had in 1936 a shorter period between full bloom and picking than normally occurs," he comments in his report of August 10. "At Medford Experiment Station, Bartlett firmness is about 18 pounds, fruit color approaches No. 2-1/2, and all lenticels are well corked. Bartlett at the Medford Experiment Station reached 19 pounds, the top of the desirable picking range, in 135 days in 1933, 120 days in 1934, 135 days in 1935, and 118 days in 1936. The summation of daily mean temperatures over 40° for these four years are (according to our records) 3145, 2454 and 2782°, respectively. Such data show little or no relation between mean temperatures and period for fruit to reach 19 pounds. There was a very early season in 1934, and a very late season in 1933....

"The figures for fruit size, completed for the Moderate soil moisture plot, show that heavy prunings compared with medium pruning (with about the same leaf area per fruit) caused 24 percent larger fruit in 1933, 19 percent larger fruit in 1934, and 31 percent larger in 1935. For these trees the total leaf area per tree was as large or larger for the heavy pruned trees as for the medium pruned trees. These data are significant in that they show that for entire Anjou trees the heavy pruning has increased leaf efficiency in relation to fruit growth to the extent of 19 to 31 percent under soil moisture conditions which are as good or better than in the well-cared-for orchards in the Valley. Data upon total leaf area per tree show 43 percent more shoot leaf area than spur leaf area in 1933, 78 percent more in 1934 and 301 percent more in 1935. Thus our data are beginning to show a rather complete story in explanation of the effect of continued heavy pruning on fruit growth--(1) Heavier pruning decreases the spur leaf area and increases shoot leaf area; (2) a unit of shoot leaf area is more efficient for fruit growth than is a unit of spur leaf area.

"For Anjou, with which heavy pruning usually increases the set of fruit as much or more than it reduces the number of blossoming points per tree, heavy pruning does not reduce the yield and increases the size of the fruit. For Bartlett, with which heavy pruning does not increase the set of fruit as much as it decreases the number of blossoming points per tree, heavy pruning reduces the yield per tree but increases the size of the fruit both because of a larger leaf area per fruit and because of more shoot leaf area per tree. We believe that Bosc responds to heavy pruning in a manner similar to that for Bartlett. For lighter soil types a greater set of fruit of Anjou can be obtained with lighter pruning, and for such light soils Anjou responses to pruning become more like the responses of Bartlett and Bosc."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"The annual meeting of the Massachusetts Cranberry Growers' Association was held Tuesday and was well attended," he writes from the Cranberry Disease Field Laboratory on September 1. "The Massachusetts Experiment Station has been experimenting this summer on the control of weeds on cranberry bogs by chemical methods and the presentation of the results of these experiments and the discussion of them was the subject of most interest at the meeting.

"The forecast for the crop in Massachusetts this year was 370,000 barrels as compared with 322,000 last year.

"Early berries are coloring well and should be in very good condition for picking by Labor Day. Temperatures went quite low on two nights. A minimum of 34-35° F. was reported from a few bogs."

He had written earlier: "For some time it has been noticed that the leaves of vines on plots sprayed with bordeaux were darker green than those of unsprayed plots. Some measurements of the chlorophyll content of leaves from sprayed and unsprayed plots, made during the week, show that the chlorophyll content of the former is some 25-30 percent higher than the latter. This may be a matter of some significance in the yield from these plots."

Henry F. Bain, Wisconsin Rapids, Wis.

"The fall meeting of the Wisconsin Cranberry Growers Association was held at Wisconsin Rapids on August 18," he writes. "The cranberry crop estimate was given out at that time as 53,000 barrels, compared to last year's crop of 77,000 barrels. Early prospects were as good this year as last, but 10 days of excessive heat during the blossoming period reduced the crop by some 33 percent.

"The drought in central Wisconsin is at least temporarily broken, several rains in the past two weeks totaling slightly more than two inches having fallen. The rains have probably helped to increase the size of cranberries.

"There has not been enough precipitation to add storage water to reservoirs, many of which contain only enough water for one or two frost floods. Consequently, unless there is abundant rainfall within the next ten days, a great many of the Wisconsin growers will start harvesting berries before they have reached proper maturity, to the detriment of the quality of the pack."

DECIDUOUS FRUIT INVESTIGATIONS

M. A. Smith, Springfield, Mo.

"Damage to field crops during the past 6 weeks has been very heavy," he writes from the Ozark Fruit Disease Laboratory on August 22. "At the present time it appears as if the drought had caused almost complete loss of corn, tomatoes and other vegetable crops. The apple crop as reported earlier was estimated at 20-25 percent for the Missouri Ozarks. This estimation must now be revised--it is doubtful if there will be over 10 percent of an apple crop in the Marionville and Republic districts. This reduction in crop is due to the drop because of the drought and a severe codling moth infestation.... Grape harvest has been in progress for the past 10 days. Moore's Early have been picked. Concords are now being harvested. The quality of the grape crop is poor."

THE GRADUATE SCHOOL

Over 50 courses are offered by the Graduate School of the Department which opened its new term September 14. Courses in economics, statistics, chemistry, languages, botany, plant diseases, personnel and business management, mathematics and trade are offered--to mention some of the more important groups. The Graduate School certifies credits earned. Acceptance, of course, depends on the rules of the college to which the credits are presented. Credits have been accepted by universities wherever it has fitted in to the approved program of the students. You can secure a program of courses by writing to the Department of Agriculture Graduate School, Room 4090 South Building-- or call Branch 317.

Dr. R. A. Fisher, noted English authority on statistics, will give three lectures under the auspices of the school in the Auditorium, South Building, from 5 to 6 p.m. September 21, 22 and 23. These lectures will deal in a general way with Statistical Inference with special emphasis on sampling and the statistical testing of hypotheses. The lectures will be followed by discussions. Special arrangements are being made also for conference groups interested in particular aspects of statistical analysis. Further information concerning these lectures and conference groups may be obtained from the Graduate School.

PHOTOGRAPHS

Miss Lillian A. Guernsey, in general charge of our photographic records and laboratory, calls attention to the fact that writers of bulletins and other publications carrying illustrations should send along with their manuscripts an additional carbon copy of the list of illustrations showing the numbers and location of the negatives from which illustrations were made. This information is necessary in locating the negatives later when prints may be called for either for our use or for outside publications. Since the general policy of the Bureau is to furnish for outside use only such illustrations as have been used in our publications, we frequently receive requests for prints of certain photographs used in our bulletins and unless Miss Guernsey has the list giving location, there is often considerable delay in locating the negatives, especially when they have been retained by the writers.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S_E_M_I-_M_O_N_T_H_L_Y N_E_W_S L_E_T_T_E_R.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

Vol. VIII Washington, D. C., October 1, 1936 No. 19

In rain Or shine

Mark Hellinger tells of a woman, visiting a State institution for the insane, who stopped to ask one of the inmates the time. He took a large ruler from his pocket and held it in the sunlight. Then he marked out the shadow cast and made some rapid calculations. He fiddled with a compass, tri-square and plumb line. "Madame," he announced, proudly, "it is exactly 14 past 2." The woman was amazed and wanted to know how he did it. He explained that it was something he had worked out--he did it by the sun. "But," she said, "how do you manage when there is no sun?" The man smiled. "Oh," he replied, readily, "I've got something for that, too." The woman asked what. "Well," he explained, "in that case I simply look at my watch."

The story appears rather apropos, so far as the Division is concerned, in connection with the comment aroused by the announcement that investigators have found that orange juice contains from two to three times as much vitamin C as tomato juice. We have been doing our best, and with considerable success, to see that the American public can get both--rain or shine. As the investigators point out, when tomato prices are much lower than orange prices, it may be possible to get as much or more vitamin C protection per dollar from tomatoes. It will not be our fault if both are not used more largely, to the benefit of the public health. Incidentally, the investigators found that the custom of squeezing orange juice at night to serve at breakfast causes a loss of 10 percent or more of its vitamin C value, even though the juice stands covered in a refrigerator. Tomato juice too, deteriorates when allowed to stand exposed to the air. The tests, conducted by workers in the Bureau of Home Economics, included both chemical analysis and feeding trials of four varieties of oranges (two from California and two from Florida), fresh pressed juice of tomatoes and juice from a brand of commercial canned tomatoes. In these particular tests, the canned tomatoes contained as much vitamin C as the fresh sample.

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASES INVESTIGATIONS.

W. T. Pentzer, Fresno, Calif.

"After several months of silence but not inactivity," he writes September 17th, "the bull will be taken by the horns and if not taken too literally, thrown in the usual rodeo style!

"During most of June our efforts were centered in Brawley, Calif. where we continued the investigations on the handling and shipping of cantaloups from the Imperial Valley. These tests were carried on cooperatively with Dr. Jagger, Dr. Wiant and Mr. Wright of our Division, and Mr. Yourman of the University of California. Particular attention was given to the refrigeration required for various maturities of the new #45 mildew-resistant melon, since it was planted in large quantities the past season and will probably be planted to even greater extent next season.

"A prelininary analysis of the results of transportation and shipping tests with this melon indicates that its quality is best on arrival in terminal markets if it is picked at the 'hard ripe' stage of maturity. When riper than this, in the 'choice' maturity, it had good quality when shipped but had passed its prime by the time it reached New York City and lacked flavor. Precooling prevented this maturity from softening and becoming affected with mold, but it did not prevent loss in dessert quality. There appeared to be no advantage in precooling to 40°F. as against precooling to 50°, the melons being similar in appearance on arrival. Precooling for only a few hours, lowering the temperature of the melons about 10° appeared to be of little value. With melons averaging 85° to 90° when loaded in the cars, the meltage of about 9,000 pounds of ice requiring about 12 hours with inside fan equipment, was necessary to attain an average temperature of 50° in the center melons of the crates. The cantaloup season was satisfactory as to price and the shippers expressed general satisfaction with the carrying quality and market experience with the #45 melon. An improvement in precooling practices was observed over last season which was credited by some agencies to our efforts in this field. A transportation trip was conducted to New York in cooperation with the Pacific Fruit Express and with assistance from Mr. Asbury as far as El Paso.

"In July, we spent some time at Riverside with Mr. Barger repaying him for his assistance in the cantaloup work by lending a hand on sugar analysis of dates. Hot weather prevailed here, especially in the laboratory, but did not quite reach the 119° that Brawley gave us during our stay there. We returned to Fresno in time for the beginning of the grape season, continuing precooling investigations with this fruit.

"A transportation test was made the last week in August with lettuce for Salinas, in which various icing methods were tried as well as the precooling of lettuce after packing and loading in the cars. This trip ended

W. T. Pentzer (continued)

in New York on September 4th, but for a few seconds it appeared that it might end about 20 miles west of Laramie when five cars were thrown from the train as a result of a broken wheel. Two of our test cars were lost, but our business car and five test cars and the caboose were fortunately left on the track. The results of the test indicated that present methods of icing maintain lettuce temperatures close to 32° throughout the trip, and that the precooling method used resulted in lower temperatures for only a short period and was of no particular value.

"The use of package ice resulted in much damage to the heads of lettuce, especially where protecting 'wrapper' leaves were trimmed. Several modifications of the present method of packing and shipping were suggested for the test."

Edwin Smith, Wenatchee, Wash.

"In Mr. Harley's opinion we have had one of the most ideal seasons as regards general fruit growing conditions," he writes September 12. "Notwithstanding, many fruits have not appeared to mature in what generally is considered a normal condition. Sweet cherries did not attain usual size nor shipping quality. Apricots did not seem to have normal quality. Jonathan apples colored early and are of small size. Picking started the last week in August and will generally be finished by September 25th. Delicious apples seem about a week earlier in reaching maturity than in 1935. Many growers report heavy premature dropping of Delicious apples, and they generally may be removed from the spurs very easily. These abnormalities are popularly attributed to the heavy freeze in October, 1935, although other factors no doubt have a bearing, as, for instance, the heavy rains ten days before the cherry harvest, or the late applications of sulphur on apples for the control of red spider....

"We have also been preparing for the harvesting work of Delicious and Jonathan apples. This year we are not starting our Delicious picking so early in order to prolong our picking until advanced maturity may be secured. The industry started picking Red Delicious the week of September 7th when the fruit was manifestly immature. From the standpoint of maturity possibly this was one week later than in 1935, though we believe a larger volume was removed during the first week of harvest this year. We believe that this situation will soon demand that this fruit be packed either under its own name or as "Red Delicious" instead of under "Delicious," if the reputation of the Delicious is not seriously to be undermined. A great deal of consultation has been called for by horticultural inspectors on the subject of Delicious maturity. This makes it apparent that the seriousness of the subject is on the conscience of one section of the industry."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on September 12th, he comments: "The South, and the pecan and tung industries, lost one of its most illustrious characters last night by the death of Mr. J. B. Wight, a true lover of everything horticultural. He was getting old and frail and a necessary operation was too much for his heart to stand.....

"The early defoliation of pecans and most other native growth is continuing unabated. The trees of Albany have much the appearance of early November because of the number of leaves being blown around. As yet the defoliation has not progressed in many orchards to the point where it might materially affect the 1936 crop of nuts, but there is a probability that some considerable reduction in the percentage of shoots blossoming may result.

"The official estimate for the 1936 crop was published yesterday and much interest in it has been exhibited. Two of the local distributors have established prices which I have not yet seen but which are said to be a few cents higher than last year's prices."

C. E. Schuster, Corvallis, Oreg.

"Where the winter did not affect the walnuts and they were sprayed for blight, the growers have large crops," he reports September 12th. "Where the walnuts were not sprayed the crops are very commonly reduced at least 50 percent. Then in addition to that comes the reduction in other districts from the winter injury."

He had written September 5th: "The work has been confied nearly altogether to the experiments in the greenhouse with nutrient materials. For the last few days an outbreak of mildew has been developing on the sunflowers. Yesterday it became quite noticeable that the boron treated plants were very resistant to his attack while the boron deficient plants were very susceptible. Whether the use of boron gave direct or indirect results we do not know as yet.

"In spite of the late spring it is becoming apparent that the harvesting will not be correspondingly late. The same thing has apparently occurred with other fruits. The normal length of time between blooming and harvesting is apparently not holding this year.

IRRIGATION PROVES VALUE IN EAST FOR ORCHARDS AND ON TRUCK FARMS

Under this title the Press Service has distributed an interesting release pointing out that fruit and truck crops may suffer from drought, even in the humid eastern states where the annual rainfall averages as high as 50 inches or more a year. "In other words, crops frequently suffer from lack of water during the critical weeks of growth, even in areas of heavy rainfall. To overcome this lack.... irrigation is necessary to supplement rainfall."

"Irrigation removes one serious hazard in successful fruit and truck production, that is, a lack of moisture in dry years or even in dry weeks during the summer season," sayd Lewis A. Jones, chief drainage engineer of the Bureau of Agricultural Engineering.

"Even in Georgia, where the annual precipitation averages 50 inches or more, we have found peach orchards suffering because of scanty moisture and have shown that plentiful irrigation will increase not only the size but the quality of the fruit. We have found citrus groves in Florida--where the average annual rainfall is about 50 inches--retarded by drought and have increased quantity and quality by irrigation."

But it is an apple orchard that offers the most striking demonstration.

"A good example," says the release, "is a large orchard at Mt. Jackson in northern Virginia. The irrigation system there, which the Bureau of Agricultural Engineering helped design in 1928, has increased the average annual yield several carloads, according to the owner, although the cost has been $700 to $800 a year, 'no more than the selling price of a carload of apples in a good year.' This year, with a generally short crop and prices high, this apple grower expects to harvest his biggest and most profitable crop.

"The orchard is on a hill about a quarter of a mile from the Shenandoah river and 80 to 90 feet above the water. A centrifugal pump at the river pumps water through about 1900 feet of 8-inch main pipe and then through distributing pipe lines to high points in the orchard. From these points it runs in furrows to all parts of the orchard except one knoll, which, however, will be piped next year. This will make about 145 acres under irrigation.

"About 35,000,000 gallons of water are pumped onto the orchard each year--equal to about 9 inches of rainfall. Asked what he would do differently if he were starting his irrigating over again, this orchardist answered 'Use more water.'"

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"The D'Anjou pear harvest is about over and Jonathan picking has started in the lower districts," he writes September 10th.

"During the past week or ten days both Jonathans and Delicious have been maturing rapidly, so much in fact that we are wondering if this is not due to some abnormal condition--perhaps mites or possibly the sprays used in controlling them. However, in checking the days from full bloom, the Jonathans fall well in the range of 135-140 days. Delicious may be a week early if we consider 140 to 145 days from full bloom. The Delicious are loosening up and many are being picked now, especially the red sport varieties. The regular Delicious are practically ready to come off, although the color is not too good in many orchards, especially those which have been infested with two-spotted mites.

"Our attention was called to a peculiar, as well as serious condition showing up on D'Anjou pears in certain orchards. It was particularly striking in the Ray C. Cain orchard on Red Apple Road. Certain fruits are actually ripe on the tree at this time, so much so that one can easily push a thumb into the flesh. "The first few trees I examined had a few fruits showing cork spot and I attributed it at first to a root condition. However, on closer examination, we found them on trees that showed no evidence of corking. The fruits that were prematurely ripened, however, showed small yellow spots ranging from the size of a pin point to a pin head; also that the trees had an abnormal amount of discolored substance resembling aphis honeydew.

"The cover crop under the trees was full of very small leaf hoppers and the under portions of the leaves harbored small insects somewhat resembling rosy or green aphis, although microscopic examinations showed them to be entirely different. Mr. Leroy Childs happened to be in town and he became interested in the problem. He was not able to identify the insect offhand. We think there is a possibility that a stigmanose may be responsible for the premature ripening of these fruits.

"It was interesting to note that most of the pears hanging near the cover crop were more badly affected than those higher in the tree. In fact, very few affected pears were found higher than 8 feet from the ground, which further points to insect injury. The cortex of the fruit is quite soft and juicy but the tissues around the core are still firm. The affected fruits are quite easily identified. We have been wondering if this could be some more of Mr. Ferrall's 'insex' appeal!"

DECIDUOUS FRUIT INVESTIGATIONS

W. W. Aldrich, Medford, Oreg.

"During the grading of the fruit," he writes from the U. S. Pear Field Station on September 14, regarding commercial picking of the Anjou pears in the Time of Irrigation and Pruning-Irrigation plots," one result was outstanding--fruit from the 'frequent' soil moisture plots was more uniform in shape and showed much less sunburn than fruit from either 'moderate' or the 'dry' soil moisture plots. Another feature, which was hard for me to believe, was that fruit from the 'frequent' plots had less skin-russeting (probably the result of low temperatures on March 20 and April 1) than the fruit from the 'moderate' and 'dry' plots. This result necessitated the conclusion that the greater tree vigor of the 'frequent' plots made the tissue of the blossom receptacles more resistant to cold injury.

"As a result of smaller amounts of these three defects--shape, sunburn and skin-russet--the ration of 'Extra Fancy' and 'Fancy' was 3-1 in the 'frequent' plots and only 2.5-1 in the 'moderate' and 'dry' plots. Whereas the differences were not large, they were sufficient to show the effects of the small differences in tree vigor occurring in the soil moisture plots this season.

"There were also less misshapen fruits from the 'heavy' than in the 'medium' pruned trees."

He had written earlier: "Night minimum temperatures have been about 44° during the last week in August, with only two maxima over 90°. As a result of this relatively cool weather Anjou and Bosc fruit growth has been relatively high. I am wondering whether this cool weather just before harvest will result in poorer than normal flavor of Bosc and Anjou.

"A series of water content determinations for Anjou fruit in New Frequent and New Dry soil moisture plots has shown water content of fruit in New Frequent to be about 84.2 percent for the light pruning and 84.6 percent for heavy pruning; in New Dry to be about 81.9 percent for light pruning and about 82.9 percent for heavy pruning.

"As in 1933, an irrigation of New Dry about two weeks before harvest and at a time when trees were suffering seriously for water did not immediately increase the water content of the fruit; whereas our results have shown that an irrigation under similar conditions in July would have resulted in immediate increase in water content of the fruit. I am wondering just what change of factors within the fruit causes this difference in response to increased water content of the soil during July and August."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"The berries from a few of our experimental plots on the State Bog were picked last Tuesday," he writes September 12, from the Cranberry Disease Field Laboratory. "These plots had been sprayed with sulphur. The yield ran lower on sprayed plots than on checks just as last year when sulfur dust was used. As most of the plots in this series were on an adjoining section of the bog which remains to be picked no decision can yet be reached as to the effect of sulfur spray on yield. However, if the yield continues to run low the use of sulfur as a spray on cranberry bogs will be eliminated.

"The first run of incubator tests on Early Black indicates that the keeping quality of this variety this year will be only fair. Keeping quality will not be as good as in 1934 or 1935 but not as bad as in 1935. However, on account of the small crop this year the trade will be less critical and as far as the market is concerned the keeping quality will be rated as good. An opening price of $11.60 per barrel has been set. This is the highest opening price in recent years."

John C. Dunegan, Fayetteville, Ark.

"Specimens of the peach rust fungus, Tranzschelia pruni spinosae, from correspondents in three different localities in Brazil, and specimens of the newly described Phyllosticta angulata, an apple leaf spot fungus from the vicinity of Vienna, Austria, had reached Fayetteville during my absence," he comments in his report for the week ending September 12, upon returning to the station after a "vacation" that included a short visit to the U. S. Horticultural Field Station, Beltsville, Md.

"These specimens were most welcome and after critical examination were added to my herbarium. Teliospores of the discolor type were present on the rust specimens and their presence enabled me to definitely identify the rust occurring on cultivated Prunus in Brazil.

"Northwest Arkansas is still badly in need of rain but scattered showers during the last two weeks have afforded a temporary relief."

NUT INVESTIGATIONS

"Final results of field studies carried on in 1935-36 on the time of natural infection by the filbert blight pathogene were taken during the latter part of the week," writes Paul W. Miller from Corvallis, Oreg. on September 12. "These results show that the host is most susceptible to infection during the fall, early winter, and early spring. No infections occurred from the inoculations made during late spring and early summer of 1936."

DECIDUOUS FRUIT INVESTIGATIONS

Henry F. Bain, Wisconsin Rapids, Wis.

"Cranberries appear to be ripening more slowly than normal," he reports for the week ending September 12. "All growers having sufficient water supplies are delaying their picking. Some picking has been done where water is short, and the production in these areas is running just about up to estimates in spite of small average size of fruit."

He had written September 5th: "Harvesting has been started in a small way, but most growers are holding off to allow the berries to reach maturity. From the middle to the last of August most of the cranberry districts had approximately the normal amount of August precipitation, and there have been no frosts on the marshes to date, the two conditions together making possible a considerable delay in the start of harvesting.

"The northernmost marshes suffered more heat injury during the prolonged heat wave of early July than those in the central part of the State. These vines bloomed somewhat later than the latter, throwing the greater part of the blossom period into the hot weather. There are many acres of vines on which the entire bloom failed to set. Considerable evidence indicates that the principal injury was to the pollen."

ADMINISTRATIVE NOTES

Pay Rolls One of our workers who spent two weeks on his uncle's farm had an encounter with a bull. It was a tossup. But the worker who has an encounter with a payroll and doesn't watch his step is in for a lot more trouble. Roy Gillette urges that employees in any way handling payrolls be very careful that those sent in for temporary and wae employees in particular have the names of workers spelled correctly and the address given accurately and in full. There have been a number of cases where payrolls have reached us with names misspelled or incorrect or incomplete addresses given, resulting in considerable delay in getting checks to the employees.

We have no way of checking names or addresses of such employees, particularly in the case of persons working on letters of authorization. This makes it double important that care be exercised to see that all information included on pay rolls is correct and complete.

It's just as simple as A-B-C--always be careful !

ADMINISTRATIVE NOTES

Automobile Anti-Freeze — The approach of cold weather, in some unfortunate sections of the country, reminds us that practically everything sold goes to the buyer--with one exception. Coal goes to the cellar. Well, never mind. We were just leading up to the thought that with the approach of--er--coal weather some of our workers are going to need anti-freeze in their radiators. Or perhaps we should say in the radiators of their automobiles and trucks.

Anyway, Roy Gillette says that the National Carbon Company's contract for supplying anti-freeze expires December 31, 1936, so send in your orders to Ray Jones promptly. The price is $1.41 per gallon in 1-gallon containers and $1.44 in 1/2-gallon containers, these prices being for deliveries at the nearest depots in case lots only--6-gallons to the case. If less than six gallons will serve your needs, your order can be filled from stock here-though, of course, this will add transportation charges to the cost.

Automobile Mileage. — If a man smashed a clock, could he be convicted of killing time? Not if the clock struck first. No, this really isn't a Comptroller General decision--just our own notion. The Comptroller General says, however, in Decision No. A-51607 that employees who use their personally-owned automobiles on official business (when such use is covered by their letters of authorization) must enter on their expense accounts the speedometer readings at the beginning and end of each period of travel.

This does not mean that readings should be recorded when stopping for lunch, etc., where this is part of the official travel, but does mean that if during a period of official travel a short side trip is made for personal reasons, such mileage must be deducted from the total reading for the period covered. The speedometer reading, that is, must show definitely the total miles traveled on official business.

Horticultural Organizations — The Division's librarian, Miss Magdalen R. Newman, has revised and brought up to date her lists of "Horticultural Organizations of the United States and Canada," and "Organizations Dealing with the Handling and Merchandising of Horticultural Products in the United States and Canada."

These lists have been mimeographed and may be secured from Miss Newman.

TEMPORARY EMPLOYMENT OF EMPLOYEES ON FURLOUGH IS NOT NOW PERMISSIBLE

"The Comptroller General, in a decision to the United States Civil Service Commission, under date of July 11, 1933 (13 Comp. Gen. 14), stated that employees administratively furloughed under the terms of section 9 (a) of the Independent Offices Appropriation Act, 1934, may be temporarily employed either in the same or another Department or office of the Government but this rule was limited to employees involuntarily furloughed and could not be extended to apply to employees on voluntary leave of absence without pay," points out Personal Circular No. 24, sent out by Dr. Stockberger.

"Under the decision referred to a number of temporary appointments in various branches of the Department of Agriculture were made.

"Since the Emergency legislation, upon which the Comptroller General's decision was based, has expired, the Solicitor of the Department of Agriculture was asked to render an opinion as to whether there is now any restriction placed on the temporary employment of such furloughed employees in other branches of the Department or in other branches of the Government. The Solicitor's opinion of April 1, 1936, states, in part:

> "'The effect then of the decision****was that the Comptroller General permitted the reemployment to temporary or seasonal positions of employees involuntarily furloughed under the provisions of the so-called Economy Act, as amended, notwithstanding the prohibitions in that regard in section 6 of the act of May 10, 1916, as amended by the act of August 29, 1916 (39 Stat. 582), prohibiting the payment to any one person of more than one salary when the combined amount of such salaries exceeds the sum of $2,000 per annum. The basis of this decision was the provision of section 9(2) of the act of June 16, 1933, requiring "as far as practicable, employment on the available work in such service among all the officers and employees****." As this was temporary legislation and expired by its own limitations on July 1, 1934, it follows that the exception to the provisions of section 6 of the act of May 10, 1916 as amended, with regard to the employment in temporary positions of furloughed employees ceased on that date.'

"From the above it will be noted that temporary employments in the Department of Agriculture of furloughed employees are not permissible. It should be understood, of course, that this ruling does not apply if the combined salary rates of pay are not in excess of $2,000 per annum."

Vol. 8 No. 19 October 1, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

Vol. VIII Washington, D. C., October 15, 1936 No. 20

The Publication of Research, etc. "The ultimate aim of research is publication," said Dr. E. W. Allen some years ago in an address before one of the classes of the Department's Graduate School. "It may be deferred, but it is due eventually if the research has been successful. To some this final task, like the end of a poor cigar, is often very bitter. But in research the end is even more important than the beginning, and quite as deserving of being well done as any other part of the work.

"The idea that in writing a paper 'anything will do' and that it is a weakness and a waste of time to be fussy about it, will rarely bring a creditable printed report or stamp the author as a painstaking investigator. Writing....is especially important for the scientist, because it is his means of communication and, to a large extent, of his influence. Hence his attitude toward the task should be right....

"Publication is a serious matter because of the permanence of the record. A printed paper can not be recalled and retracted as the spoken word can; it stands for all time. Of course, a statement may be explained or modified after it has been published, but it is difficult to reach all the readers of the original, and the correction may be overlooked in future citations.

"For us in the Department of Agriculture, which stands so close to the public on the one hand and to various branches of science on the other, the obligation to publish the results of investigations in suitable form is not less heavy than that of making the work itself exact in method and deduction. The manner in which this is done will reflect not only upon the individual worker but upon his organization and the Department as a whole."

It was an appreciation of the fact that the character of our publications reflects upon the Division as well as upon the worker that led Dr. Auchter back in 1930 to designate Mr. W. W. Gilbert as his assistant in the handling of manuscripts offered for publication by this Division. Mr. Gilbert has a background of more than thirty years' research experience and so is in a position to render valuable help in subject matter editing.

BUT--the annual reports of the Chief of the Bureau of Plant Industry show that our Division workers published no fewer than 229 papers during the fiscal year 1935 and approximately the same number in 1934. These totals include papers in outside journals as well as those issued in the various Department series, but do not take into account the half-hundred put out each year in mimeographed or multigraphed form to meet emergency situations. Every one of these manuscripts receives Mr. Gilbert's personal attention before going forward from the Division to the Chief of Bureau. It is obvious that he has time for nothing more than a checking of subject matter and the suggestion of technical improvements. He cannot rewrite or even rearrange the material for you--and, unfortunately, sometimes the manuscripts need just that. (Hence this attempt to assemble in a single memorandum the general suggestions regarding the preparation and handling of publications!)

It is not expected that the worker will submit his manuscript in such perfect form that it can go immediately to the printer, but it is felt that regardless of whether the writer has a natural or acquired faculty of good expression it is not too much to expect that he should at least see to the accuracy of his material, conciseness, statements of fact, technical terminology in his own field, computations and citations. It is not unusual for us to receive manuscripts containing invalid or erroneous names of genera, species, and horticultural varities, incorrect citations, inaccurate calculations, lack of agreement between text and tables, poor arrangement of data, too wordy and long, and other discrepancies and errors--matters that belong entirely to the sphere of the author.

The general public does not benefit from research work until the results are made available in publications. The aim in publishing research is to leave the field clearer than you found it. The reader should never be left in doubt as to what you meant to say, hence a writer should be careful not to overestimate his ability to dash off a research paper at odd moments.

In presenting a scientific paper the author says, by inference at least: "Here is the product of my labors upon this subject, taking advantage of what others have done and building on that foundation. I present it because the work has reached a stage which marks an advancement worth recording. I give it to you in a simple and straightforward form which will enable you to understand the status of the subject, my contribution to it, and its bearing or application. It is the product of my investigation and my mature judgment. I am ready to stand by my work and be judged by this account of it."

"A conspicuous example of the kind of writing required to explain intricate scientific principles in language which laymen can understand appeared this year in Farmers' Bulletin 1744, 'The What and How of Hybrid Corn,' by F. D. Richey," says the annual report of the Director of Information for 1935. "There is no better way to indicate to laymen the real significance of the results of scientific research than to take them behind the scenes, to interest them in the principles involved, to reveal interesting angles and tangles, to record some of the failures as well as the triumphs."

"Suggestions to Authors of Papers Submitted for Publication by the United States Geological Survey, fourth edition," one of the best publications of its type coming to our attention, contains many helpful suggestions for the writer, not only in regard to the mechanics of preparation but also (pp 49-101) as to expression, etc. This 126-page bulletin is sold by the Superintendent of Documents, Government Printing Office, at 15 cents.

In preparing a paper for publication, the author should first of all, of course, have a clear idea of the different series and the kind of material used in each. He can often get help in this direction by examining good publications in the series to which he proposes to contribute.

Farmers' Bulletins should be concise, pertinent statements, in non-technical style regarding subjects of broad interest coming properly within the range of our activities. Recommendations and directions applicable to modern agricultural practices are especially desired. These bulletins should be short, preferably not more than 16 pages.

Technical Bulletins should contain reports and results of research and experimentation, technical discussions or compilations, and ordinarily will be intended primarily for specialists.

Circulars should carry in brief form semi-technical material of a nature intended primarily for special groups or for limited or temporary distribution.

Leaflets should be concise and popular in nature, and must not exceed 8 pages. They should carry in brief form and simple language information that can be easily understood and readily applied by the reader.

Miscellaneous Publications include those of a miscellaneous nature that do not fall within the divisions already mention--in particular, odd sized publications, larger or smaller than the usual octavo size.

Journal of Agricultural Research contains highly technical contributions of limited scope--concise reports of the essential data and conclusions of original research of direct or indirect importance to agriculture. In general, articles should not be more than 12 printed pages in length. For detailed instructions, see Miscellaneous Publication No. 3, Editorial Policy Regarding the Journal of Agricultural Research.

Manuscripts intended for the Journal of Agricultural Research are now tentatively submitted by the Chief of Bureau to the Journal Editorial Committee before they are edited in the Bureau's editorial office. If accepted, the papers are returned to the Bureau for the usual editorial attention. This method of procedure makes it even more desirable than in the past that papers be submitted in the best possible form for while the Journal Committee will understand that the papers are to be edited before their final publication, it will undoubtedly be influenced in its acceptance or rejection of them by the clarity of presentation.

Popular Publications

Fundamental considerations in the organization of material for a popular bulletin (Farmers' Bulletin, Leaflet, and most Circulars and Miscellaneous Publications):

A. General organization of material:

1. Purpose for which paper is written.
2. Character of material.
   a. Is the material temporary or permanent?
   b. Is it intended to inform, or to be used for propaganda in the development of a constructive program?
   c. Is it of historical, theoretical, or practical import?
   d. What individual problem does it present?
3. Audience to be reached.
   a. Background: i.e., interests, requirements, etc.
   b. Personnel: i.e., adults or young people; rural, urban, or small-town dwellers; growers on large or small scale; consumers.

B. Study of material:

1. Is the material already available; i.e., are the facts well known, or has the author discovered something new?
2. How important is the material?
3. What is the interest; i.e., general or special?
4. How adaptable or suitable is the material to the audience?

C. Technique of presentation:

1. The title should attract interest but should not be misleading. It should accurately reflect and indicate the contents of the paper. It should be clear, grammatical, and as brief as is consistent with clarity. Double or divided titles are undesirable.
2. Outline or arrangement of material:
   a. Material should be studied carefully for logical sequence andorder of presentation.
   b. Headings and subheadings should be selected with care as to whether they should be nounal, participial, or verbal in nature, and then they should be made uniform throughout; there should be a close and definite

relation or connection between heading and text, coordinate headings must be of equal importance; all headings must be clear, concise, brief, expressive, and understandable.

c. The order of treatment may be (1) pedagogical or psychological, or (2) historical, sequential, or logical. For popular papers the first treatment is generally preferred.

d. Summary. Strictly popular material should be brief and to the point and usually does not need a summary.

3. Illustrations are particularly important in popular and semi-popular material and should be selected with care. Only prints with clear contrasts that will reproduce well, and those that tell a story and so definitely assist in the presentation of the subject, should be submitted.

Material to be presented in the form of graphs should be studied carefully. Discontinuous functions, variations, or relations should be illustrated by bars; continuous or progressive variations by curves.

4. Tabular material ordinarily has no place in a strictly popular bulletin. It must justify itself or it should not be included.

Technical Publications

Fundamental considerations in the organization of material for a technical paper (Journal of Agricultural Research Technical Bulletins, and some Circulars and Miscellaneous Publications):

A. The technical paper should not present popular material.

B. The title should not be too long or too short, should describe the paper with accuracy, and should be worded so as to index readily.

C. Parts of paper:

1. The introduction should explain why the work was undertaken; should present reasons for its existence.

2. The review of literature should be brief, but should cite relevant material.

3. Material and methods. The materials, apparatus, and methods used and the conditions under which the work was done should be described.

4. Presentation of data or results. The facts or data brought out in the investigation should be set forth in logical order. If this material is brief and simple, a single heading may suffice. If it is complex or elaborate, appropriate headings and subheadings will aid the reader. The interpretation or discussion of results may sometimes be placed advantageously under a separate heading.

5. Conclusions and summary.

a. Conclusions. Certain types of papers require the inclusion of a separate section giving the writer's conclusions. This section should set forth the inferences and deductions drawn by the writer from his

experiments. It should, however, include only those inferences and deductions for which a basis has been stated in the text, and it should not forecast proposed investigations.

b. The summary should give the substance of the entire paper concisely. It should contain only material already set forth in the text, and should not state a case more sweepingly than does the text, nor contain speculative or philosophical matter that cannot be justified, or forecast proposed investigations.

6. Literature Cited. Only references cited in the text should be listed in Literature Cited. If there are seven or more citations to literature they should be grouped together at the end of the paper under the heading Literature Cited; if fewer than seven, they should be given in footnotes.

If the original of an article has not been consulted the following statement, in brackets, should be added to the citation: "Original not seen." If only an abstract can be cited, the word "Abstract," in parantheses, should follow the title.

Unpublished material, exsiccatae, and any citations not satisfactorily placed in Literature Cited should be in footnotes even if other references appear in the list.

Citations should be in the form and style used in the Journal of Agricultural Research. They should be typed double space.

D. Study of material.

1. The paper as a whole should be carefully gone over for words or sections that can be deleted without destroying its clarity or adequacy.
2. Material that is commonly known should not be included.
3. Criticisms of the work of other writers should be restricted to the accuracy of such work.
4. Detailed discussion of figures and tables, unless interpretative, should not be included. The mere repetition or restatement in the text of data shown plainly in the tables, without pointing out significant relationships, is not allowed.
5. Tabular matter should be carefully checked against text to see that there are no discrepancies between statements and figures.
6. Nomenclature should be correct. Scientific and common names should conform to recognized practice; any deviations therefrom, with reasons for them, should be referred to the Chief of Bureau for approval.
7. Only such illustrations should be chosen as are necessary to a clearer and better understanding of the text. It is not advisable to duplicate tabular matter in charts or graphs.

General Instructions for All Types of Papers

There are, of course, many styles of printing that are sanctioned by good usage, but in an establishment as large as the Government Printing Office, where work is handled by many different people, definite rules of style are needed to assure a harmonious and standardized output. As a general rule copy is printed in conformity with the United States Government Printing Office Style Manual. (This may be secured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at $1.00 a copy--an excellent abridged edition for 20 cents. "Suggestions to Authors of Papers Submitted for Publication by the United States Geological Survey," Fourth Edition, sold at 15 cents a copy, contains, as already mentioned, many helpful suggestions for the writer.)

Webster's New International Dictionary, current edition, must be followed in spelling, compounding, dividing words, etc. except where deviations therefrom are authorized in the Style Manual. Standardized Plant Names is the authority for capitalization, compounding, and spelling of the common names of plants. The spelling of geographic names must conform with the decisions of the United States Geographic Board and its successor, the Division of Geographic Names. In the absence of such a decision, the United States Postal Guide is used for names in the United States and its possessions, and the rules of the Board and Division are to be followed in the spelling of foreign names.

As a general rule, designation of geographic terms covering the extent of territory or area should be: Region - The geographic divisions of groups of States as used by the Bureaus of Agricultural Economics and the Census, as North Atlantic, North Central, South Atlantic, South Central, Western, etc.; also the Mississippi Valley Rocky Mountain, or Pacific coast regions; the Corn Belt; the Cotton Belt; the Great Plains. Area - Geographic or physical divisions of one or more States and of less extent than a region, as the Coastal Plain, the Mississippi Delta, the Texas Panhandle, the "Inland Empire," the spring wheat area. Section - Parts of a State or States, as the Upper Peninsula of Michigan, the black prairie section of Texas, the Eastern Shore, the Shenandoah apple section. District - Part of a State, as the apple-growing district of western New York, the Adirondack district of New York, the Black Hills. Locality - A town or part of a county.

Tables. Tables should be typed on separate sheets as they are handled separately at the Government Printing Office. Do not put different units in the same column unless the unit is placed in the stub instead of at the head of the column. In figure columns zero should be used to denote experimentation with negative results, or that data are unavailable but the quantity or number is zero. Leaders (....) should be used to denote absence of experimentation or data. Tables should read across and should consist of three or more columns and of two or more lines, the most essential material going in the stub; variables or material relating thereto should go in columns to the right. The headings of tables should be brief but comprehensive. Box heads should also be brief, and usually the unit of measure should be placed at the head of column rather than in the box head.

Appendix. An appendix is rarely necessary in the Department's publications, but when supplied the following directions should be observed:

(a) Matter that is supplementary should be placed in the Appendix.

(b) Tables that contain data not essential to the text, and tables in great detail and not of interest to all readers, should be in the Appendix.

(c) Table and footnote references in the Appendix should be numbered consecutively with those in the text.

(d) Literature Cited should follow the Appendix.

The manuscript should be critically reviewed, and revised when necessary, by at least one other person (preferably one qualified from a literary viewpoint) in the division with which the author is connected, as well as by the head of the division. All computations and citations should be carefully verified. The full scientific name, with authority, is given the first time it appears, and may be given again in the summary if necessary. Footnotes should be held to a minimum and should be numbered consecutively throughout the paper (except that footnotes to tables are numbered for each table separately). All acknowledgements should be included in one footnote at the beginning of the paper.

The following papers should accompany the manuscript when it is submitted for publication:

(a) The form "Manuscript Submitted for Publication" (green), filled out and signed. On this form the distribution desired is indicated. All distributions to be made at the time of publication should be taken care of through mailing lists (designated by their key numbers) or addressed franks (to be furnished when galley proof is returned).

(b) A table of contents should be furnished, showing proper relation of headings.

(c) A list of illustrations, if any. Two carbons of this list should be furnished--one to go along with the carbon copy of the manuscript used for reference, the other (showing the numbers and location of negatives so that they may be found promptly in case prints of the illustrations in the publication are requested later) to be filed with our photographic section.

(d) A carbon copy of the MS for reference or consultation.

(e) If the work of any other bureau is involved, the approval of the Chief of that bureau should accompany the manuscript, this being obtained through Dr. Auchter before the manuscript is sent forward.

Reference to Commercial Institutions. It is contrary to the policy of the Department to refer by name in any of its publications to commercial institutions, commercial products, or private enterprises--this is to avoid the use of the Department as a medium for advertising. Employees should exercise care in making statements, orally or in print, that might be used to promote commercial products or enterprises.

Preparation of the Manuscript

Manuscripts should be typed on 8 x 10-1/2 inch sheets, writing on one side only and leaving at least a 1-inch margin all around. An original and one carbon copy of manuscripts for publication in the Department's series are needed, with an extra copy of the list of illustrations showing the numbers and locations of the negatives. This is for our photographic section so that negatives may be found promptly if prints are requested later. (Three copies of manuscripts for outside publication are needed. See "Outside Publication".)

All text matter, legends, footnotes and literature citations are to be typed double space. The footnotes are typed just below the reference to them in the text, set off by lines above and below.1/

1/ Footnotes are numbered with superior figures, as 5/. Text references to Literature Cited should be in italic figures enclosed in parentheses, as (20). In the list of literature citations itself, however, the figures should be enclosed in parentheses but not italicized (20).

End each page with a paragraph because the material is distributed among several typesetters at the Government Printing Office and is not easy to handle and collate if paragraphs are split at bottom of page. Tables should be typed on separate sheets, as they, too, are handled separately.

The table of contents (for printing) for all manuscripts except those intended for the Journal of Agricultural Research should contain all first and second headings, the latter indented four spaces. If there are many headings, only those of the first series need to be shown. A second table of contents (for the guidance of editors, and not for printing) showing proper relationship of all headings should accompany the manuscript.

Legends for text figures should be typewritten in the manuscript immediately after the first reference to the figures and set off by lines as with footnotes. This is overlooked in practically 70 percent of the manuscripts received and makes a lot of work for the editorial clerks. Legends for plates are not typed in the manuscript but on separate sheets to accompany the plates. Mount photographs by inserting corners in slits cut in the 8 x 10-1/2 sheets, writing title lightly on back of photograph in pencil and typing it on sheet. Illustrations should be numbered with Arabic numerals (plates and text figures separately) in the order of their mention in the text. When two or more illustrations are grouped on one plate or figure, the parts should be designated as A, B, C (not figures 1, 2, 3). Further subdivisions should be marked a, b, c. Lettering on the face of illustrations should be done lightly in pencil and the finished lettering left to the Section of Illustrations. Do not paste on cut-out letters or figures. The usual practice is to submit sketch in pencil to show layout of charts or graphs, the Section of Illustrations turning out the finished job.

Corrections and Alterations in Proof.

"Every effort must be made to reduce to a minimum the charge against the printing fund due to authors' corrections and alterations in galley and page proofs," says Section 1341 of the Department's Administrative Regulations, effective July 1, 1936. "The necessity for alterations in proof would be practically avoided if all manuscripts or copy were carefully prepared, edited, revised, or otherwise perfected before submission for printing. Only such changes as are absolutely necessary should be made in the proof. When a manuscript has advanced to galley or page proof, it is too late to undertake to improve the language, form of expression, capitalization, paragraphing, etc."

One copy of the galley proof is sent by the Bureau's editorial office to the author along with the original manuscript, through Mr. Gilbert's office, for reading and correcting. In the meantime a second galley proof is read and corrected in the Bureau's editorial office. When the manuscript comes back from the author (through Mr. Gilbert) with the galley as corrected by him, his corrections are transferred to the copy of the galley in the Bureau's editorial office and that goes to the printer. Page proof is usually accompanied by the previously corrected galley proof and goes through the same channels back to the printer. No page proof of Journal of Agricultural Research papers is furnished because of exigencies of schedule of publication. Special care should be given to see that all necessary corrections for JAR papers are made in the galley proof.

Routing the Manuscript

It may help to a better understanding of the work involved in getting into print if we outline the road traveled by your manuscript.

1. It goes first to Dr. Auchter through your section leader for a preliminary examination and, if approved, to Mr. Gilbert for subject matter and general preliminary editing.

2. When edited and checked by Mr. Gilbert it is returned to Dr. Auchter for transmittal to the Chief of Bureau.

3. After preliminary approval by the Chief of Bureau it goes to the Bureau's editorial office (Mr. Pickens) where it is filed in chronological order awaiting the bureau edit. After this editing and other attention there it is sent through the Chief of Bureau to the Office of Information (Dr. Merrill) where it is given final editorial review and any necessary work on the illustrations is taken care of by the Section of Illustrations (Mr. Stevenson). If any questions are raised in the Bureau editorial office or the Office of Information, the manuscript comes back to us for attention.

4. When finally in satisfactory form the manuscript goes from the Office of Information to the Government Printing Office.

Outside Publication

Rather extensive use is made of publication outside of the Department in order to get our research findings distributed as promptly and as widely as possible to those who can use them to advantage. Our technical workers present papers at meetings of scientific societies for later publication in the society's proceedings, and they also contribute papers from time to time to outside journals in horticultural and related fields. All such papers (as well as talks before meetings, radio addresses, etc.) must be approved in advance if they treat in any way of the policies of the Department. Employees need approval, too, for attendance at meetings even though no paper is to be presented.

When editors request an article, no agreement or commitment should be made until the actual approval of the Chief of Bureau has been secured. In asking for approval we must indicate the publication which desires the paper, the compensation if any, etc. Make sure that all manuscripts are headed UNITED STATES DEPARTMENT OF AGRICULTURE, Bureau of Plant Industry, Title _____ by John Doe, assistant horticulturist, Division of Fruit and Vegetable Crops and Diseases. This is necessary to ensure proper identification and credit when the paper is published.

Send manuscripts for outside publication in triplicate--an original and two carbon copies. The original goes to the Chief of Bureau for approval, one carbon copy is sent to the Office of Information, and the other carbon is filed in Mr. Gilbert's office with the request for approval of outside publication, for reference. When approved, the original manuscript is returned to the author with the approval notice, and with any changes considered desirable inserted. Telegraphed approvals are undesirable since it is often not practicable to indicate in a telegram the changes that have been found desirable in the manuscript. For this reason it is very important that papers to be read at meetings be sent to us in ample time to permit editorial reading and handling and return to the author in time for the meeting.

Such manuscripts should be sent to Dr. Auchter through your section leader who, if he approves, will prepare the usual form requesting permission for outside publication. Five copies of this form for approval of outside publication are needed--original, carbon on green form for Bureau's files, two carbon copies on white thin forms, and one carbon copy on thin white plain paper for Mr. Gilbert's follow-up file.

Since papers for outside publication are usually furnished without charge to the journals concerned, the publishers should be requested to supply you free with such reprints as you may need. This should be taken up with the publisher at the time the manuscript is offered for publication.

Photographs

Where photographs are to be supplied to outside agencies, it should be remembered that it is the policy of the Bureau to furnish only such photographs as already have been used in either Department or other publications. When such photographs are furnished, those proposing to use them should be requested to note that the illustrations are reproduced from the bulletin, circular, or journal in which they appeared, without further credit to the Bureau than may inhere in the correct citation: "This photograph is furnished with the understanding that if used it will be noted: 'Reproduced from _____.'"

It is permissible in special cases to furnish previously unpublished photographs for outside use with special articles primarily presenting the result of some phase of our work, but care should be taken, even in such instances, to supply only such unpublished photographs as we are not likely to wish to use later in one of our publications.

All photographs intended for outside use must be submitted to Dr. Auchter.

Journal of Agricultural Research Separates

Reprints or separates of papers appearing in the Journal of Agricultural Research are not available as a rule until a month or more after the appearance of the particular number of the journal in which they are printed. Under present arrangements, no separates of Journal of Agricultural Research papers are set aside for free distribution. The Bureau receives 250 copies of which 10 are retained as a Bureau reserve, 10 to 15 copies are held as the Division's reserve, and the remainder are sent to the author--or divided among the authors in case there are two or more.

Requests for such reprints or separates should therefore be addressed to the author, or to the Superintendent of Documents, Government Printing Office, Washington, D. C., who prints additional copies for sale at 5 cents each when the advance demand, based on the return of the notification slips he sends out, makes this desirable.

Reviewing Manuscripts

Occasionally manuscripts prepared in other Bureaus of the Department are sent to members of our staff for reading and comment. An original and three carbon copies of any comments or criticisms must be sent to Dr. Auchter with the manuscript when it is returned. The original and two carbon copies go to the Chief of Bureau with the returned manuscript, and the other carbon is filed with Mr. Gilbert.

Distributing Publications

Bureau of Plant Industry Memorandum No. 681, dated November 7, 1932, directs that all orders for publications must be sent through the Bureau's publications office. This means that in our Division all orders must first go to Mr. Gilbert for checking and forwarding to Mr. Pickens. The law (U. S. Code, Title 44, Sec. 95) provides that the work of addressing, wrapping mailing and otherwise dispatching publications for public distribution be handled at the Government Printing Office. We are allowed to send publications direct where passages are marked in answer to inquiries, etc., but ordinarily all bulletins are to be sent from the Government Printing Office.

Where less than 8 are to be sent, a suitable addressed envelope, about 7 x 10-1/2 inches, is used, the bulletin number, series and number of copies needed being written on the inside flap--for example, 2 copies of Farmers' Bulletin 1447-- and initialed by the person ordering. This addressed envelope takes the place of an order. Where 8 or more bulletins are to be sent, use the order form--No. 75 (white) for Farmers' Bulletins and leaflets; No. 74 (blue) for all other publications. Pin or staple to the back of the order an addressed ungummed frank.

Orders, envelopes and franks must have the name of the Division stamped or typed on them, and the orders and envelopes should bear the initials of the person ordering, so that they may be notified in case the publication cannot be sent for any reason. So far as practicable, check to see if the publication is actually available before you send in an order for it. It is useless, for example, to order Bureau of Plant Industry Bulletins or Circulars, Department Circulars (the old series; the present series is called Circulars only, not Department Circulars), or Department Bulletins, as these are no longer available except where copies may be in the hands of the author or the issuing bureau or office.

The maximum number of copies of a publication that may be sent to one Washington, D. C. address is 50; more may be sent to a field address. Where more than 25 are ordered a statement should be attached showing the need for them. Where publications are being sent at the request of a Member of Congress, use the 5 x 8 Congressional order form so that the Office of Information may charge the publications to the Congressman's quota. With foreign addresses, orders are prepared on form 81 (original) and 81-a (duplicate) both being sent to Mr. Jones (Supply Section) where arrangements will be made to pay postage. Use the 4 x 5 foreign frank. Where more bulletins are being sent than will go in an ordinary bulletin envelope, or where the package will exceed in weight the limit for the country concerned (see Postal Guide) additional franks must be supplied for the overflow. If the publications can be supplied by the Office of Information they should not accompany the order; otherwise they must be sent with it, the order having the word "herewith" typed below the title of the publication. Where the same bulletin is being sent to a number of addresses (domestic or foreign) you should use but one order, typing on it "To the _____miscellaneous addresses covered by the attached addressed franks."

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and other represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. VIII Washington, D. C., November 1, 1936 No. 21

Drip Meters

A young woman who was negotiating the purchase of an automobile appeared to be very well satisfied with the make and model she was inspecting. "It's lovely," she admitted. "Now, please," she added briskly, "show me the depreciation. I understand it is quite heavy in this car." The salesman was not at all upset "As a matter of fact," he explained, smoothly, "we found it such a source of worry that we had it removed altogether."

Wait! Maybe Eddie Gorman had been at work on the car. If any one could remove the depreciation, Eddie could. Yes, he's taken out another public service patent, No. 2,057,234. Of course, he has not taken out all the patents issued up to No. 2,057,233; simply most of them. This latest one covers a drip meter--a device that measures the melted ice in a refrigerator car. The general practice now, of course, is to fill the bins and at the end of the trip look at the ice remaining and guess how much has melted. No more! Eddie's gadget fits under the car, catches the melted ice water and measures it.

The point is, of course, that Mr. Fisher and the boys in the handling, transportation and storage and market disease section--including the Mr. E. A. Gorman aforesaid--are passing out another extra dividend. Refrigeration rates for perishable products are set by the Interstate Commerce Commission largely on the basis of the ice used. The drip meter will provide more accurate data and pave the way for added savings. Modified forms of transit refrigeration developed in the Division are now saving upwards of $40 a car, principally in ice consumption, a saving that represents not merely a substantial dividend on the funds invested in our work, but which in unfavorable seasons may easily mean the difference between profit and loss to the grower.

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASES INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

"We made our first pickings of Richared, Starking and Delicious apples the week of September 14-19. Of the Red Sports of Delicious this picking took place after the first commercial pickings had been made, but about as the bulk of the crop was being harvested, which, in our estimation was a week or ten days too early.

"Just as last season was known as the 'the year of the big freeze' we believe the season of 1936 will be known as the 'great green apple year.' Due to exceptionally early coloring, a large tonnage of all varieties was harvested while very immature. At Monitor a grower brought in 1500 boxes of Winesap apples for packing before September 25th. While these were being delivered another grower drove past with his truck loaded with peaches! This advancement in harvesting operations, in one respect, however was very opportune in view of the warehousemen's strike which went into effect October 2d!

We observed Jonathan apples being marketed in peach boxes. Possibly 50 carloads have been shipped, with a good demand prevailing in some quarters for this smaller package, which certainly is an awkward one to warehouse, since it is packed with a bulge...

"Mr. Harley has encountered a new physiological disorder in Anjou pears at the time of harvest. Individual pears, scattered throughout an orchard, turn yellow and ripen on the trees, though the crop at large was merely at the proper picking maturity. An entire pear may soften, or they may soften only on one side. Some of the pears having this disorder have cork-tissue; others do not.

"Commercial cleaning of apples sprayed with fluorine has been quite satisfactory to date. In most instances 2 percent boric acid has been used with hydrochloric acid. In excess of 100 official samples have been analysed in the local commercial laboratories and none have been in excess of tolerance. Most of these samples have had duplicates sent to the Food and Drug Administration laboratory in Seattle. Results have been agreeing satisfactorily.

"Weather has been ideal. Frosts occurred on the nights of September 15-16, with higher temperatures following. Fruit colored better than during any season since the trees were very small. Jonathan and Delicious have packed out 60 to 65 percent Extra Fancy and a minimum quantity of 'C' grades as far as color is concerned. Sizes of Jonathans and Winesaps are running small."

U. S. HORTICULTURAL FIELD STATION, CHEYENNE, WYO.

President Roosevelt's Visit. "The station was honored on October 11th by a visit from President Roosevelt and party," writes A. C. Hildreth. "The entourage included Mrs. Roosevelt, Secretary of Agriculture Wallace, Governor Leslie Miller, Senator Joseph O'Mahoney, Brigadier General C. F. Humphrey of Fort Warren, and other State and civic officials. The President's visit was necessarily brief as he arrived at 2:45 p.m. and had a speaking engagement at the Fort at 3 p.m., but he greeted members of the staff in front of the office and expressed interest in the work under way and the marked development of the station since his visit here in 1932."

Dr. Hildreth addressed a meeting of the Garden Club of Greeley, Colo. on horticultural subjects the evening of September 22d. Dr. W. J. Zaumeyer visited the station on the 23d. On the 24th a group interested in tree planting and shelterbelts spent several hours at the station with Dr. Hildreth. This group included Dr. R. E. McArdle, Forest and Range Experiment Station, Fort Collins, Colo.; H. D. Cochran, assistant forester, W. S. Forest Service, Denver, Colo.; R. T. Ford, extension forester, Fort Collins; W. O. Edmondson, extension horticulturist, University of Wyoming; and W. L. Quayle, director of experiment farms, University of Wyoming, Laramie, Wyo.

DECIDUOUS FRUIT INVESTIGATIONS

John C. Dunegan, Fayetteville, Ark.

"A summary of the weather conditions for September shows a total of 10.92 inches of rainfall for the month," he writes for the week ending October 3d. "This is a very decided increase over the preceding months. The temperature ranged from a maximum of 100°F. during the early part of the month to as low at 47°F. on September 30.

"The peach scab fungus, *Cladosporium carpophilum*, is developing very extensively on foliage of non-sprayed trees. I have observed this fall development of the scab fungus on peach leaves from time to time in the past but the disease seems to be extremely prevalent this season."

He had written September 26th: "A rapid survey of our experimental plots at Rupple Brotner shows a loss of 14 trees in a total of 105 Ben Davis trees as the result of the drought. With the advent of rainy weather a number of the trees are producing new shoot growth and the blossom buds are beginning to open. One tree was noted that appeared to have almost as many open blossoms on it on September 23 as it did in April."

DECIDUOUS FRUIT INVESTIGATIONS

G. A. Meckstroth, Willard, N. C.

"I was asked by Mr. Watson, extension horticulturist at the North Carolina State College, to take some material for a strawberry disease exhibit to Mount Olive, N. C., for the Farmers' Festival, held September 24, at which about 10,000 people were present. Our exhibit attracted much attention and I had an opportunity to discuss strawberry disease control measures with a good many growers. The leaf spot disease was very severe in the Mount Olive section last spring, and some of the best growers are realizing that control measures must be undertaken to secure profitable returns. A number of growers are planning on spraying for leaf spot next spring. The growers were also very much interested in cultures of the strawberry dwarf nematode shown under a binocular microscope....

"During the week ending September 26, I cut the stolons on about 25 strawberry stolon grafts which I had made in the greenhouse and field. To date there is no indication that the Blakemore yellows is transmitted to normal runner plants by means of grafting stolons from yellow and normal plants."

He had written previously: "The twentieth annual field day and basket picnic was held at the Coastal Plain Station on September 17, with an attendance of about 10,000. The morning was taken up with a series of demonstrations and a speaking program; in the afternoon opportunity was given visitors to inspect the experimental plats and fields, all of which had been labeled.

"I had been asked to prepare an exhibit on plant pathology, and in this I made a special effort to show the diseases of strawberries. A great deal of interest was shown by the growers, and I discussed with a good many the question of spraying for control of leaf spot.

"Dr. J. R. Christie of the Division of Nematology, had supplied me with several cultures of the strawberry dwarf nematode which I placed under a binocular for inspection, and this exhibit attracted much attention. It brought a good lesson home to the growers; they have seen the dwarfed and crimpy plants in their fields and they were much interested in seeing the nematodes wriggling about by the hundreds in the tubes.

"I also showed some strawberry stolon grafts which I had made in an effort to study the possible transmission of the yellows diseases. Root knot and southern blight (Sclerotium rolfsii) were also shown in their relation to crop rotation and strawberry culture."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"The commercial cranberry harvest is nearly finished, and a number of growers have sent their pickers back to Philadelphia," he writes from the Cranberry and Blueberry Disease Laboratory on October 15. "There was a light frost on the morning of the 13th, but not enough to do any damage even where there are still cranberries in the field."

He had written September 30th: "The crop is falling substantially behind previous estimates, and apparently will be much below the original forecast. The quality appears at present to be rather good.....On two bogs we made our first experimental applications of bordeaux for the 1937 season. These were made immediately after the crops were picked. It is customary in New Jersey to put a reflow on the bogs at that time for insect control, and to hold the water for from one to two weeks. We have put on experimental sprays 24 hours before this reflow to see whether we can reduce infection of the newly-formed terminal buds."

Earlier he had reported the picking of a considerable number of plats showing comparisons of copper sprays and dusts for rot control and also the effect on the fruit of spraying the bogs with pyrethrum-kerosene for leaf-hopper control. The berries from these units had not then been sorted.

The cranberry harvest started on most bogs immediately after Labor Day. There then appeared to be something of a labor shortage for the work. Many growers still prefer to harvest their berries by hand, but this is becoming increasingly difficult, and scooping is now the rule.

August 31: "Cranberry crop estimates have been compiled by the statisticians, and forecasts made. The present indication is for a crop of just about the same size as that of 1935, so far as New Jersey is concerned. This will be the third very small crop for this State out of the last four years; considering the spring frosts and high summer temperatures experienced here this year, however, this will not be doing badly.

"Blueberry bushes in some fields are suffering severely from dry weather. This is cutting down the growth of this year, and will presumably reduce the crop of 1937.

The aerial spraying equipment was shifted from an airplane to an autogiro and brought back to the cranberry district the middle of August to demonstrate what was considered a superior atomization of the insecticide. No test of the effectiveness of the apparatus could then be secured, however, since it was too late in the season to get reliable leaf-hopper counts.

DECIDUOUS FRUIT INVESTIGATIONS

C. P. Harley, Wenatchee, Wash.

"The Wenatchee Valley is rapidly reaching the peak of the apple harvest," he writes October 7th. "Another ten days or two weeks will see practically the entire crop off the trees. This has been the most ideal harvest season that we have experienced since 1933. In fact, I do not recall any year that was quite as ideal as this during the past ten years. The quality in practically all varieties is exceptionally good. We have had perfect coloring weather and almost no wind or rain.

"Besides this the returns to the grower this year are quite encouraging. Early Red Delicious brought as high as $1.80 per box to the grower; other varieties ranged from $1.10 to $1.40 depending on size and quality. Growers who are in a position to store their fruit will perhaps realize more than this.

"There has been a general tendency for most growers to pick their late varieties a little early. A vivid recollection of last year's freeze perhaps is partially responsible for this, also the desirability to maintain their picking crews. The harvesting of Winesaps and Yellow Newtowns was started as early as September 24th. This was about two weeks ahead of the maturity dates from full bloom. According to fruit measurements which we have been making on Winesaps and Yellow Newtowns this early picking will mean a loss of over 6 percent in tonnage over this two weeks period. According to our measurements, had this fruit remained on the trees ten days it would have increased one box size."

W. W. Aldrich, Medford, Oreg.

"This fall I have again observed many instances where, under conditions of approximately similar tree size and soil moisture, Anjou trees have shown such signs of serious water deficits as wilting, leaf yellowing or partial defoliation where Bartlett and Bosc have not," he writes from the U. S. Pear Field Station on October 12th.

"Such observations, coupled with our pruning results showing that Anjou responds to pruning with a greater increase in set than do Bartlett and Bosc, strengthens my idea that the water supplying ability of Anjou roots is appreciably less than for Bartlett and Bosc. The earlier removal of fruit from Bartlett might explain better root development for that variety, but Bosc holds its fruit for the same period as does Anjou. The question in my mind is whether Bosc leaves have a lower transpiration per unit area or whether Bosc roots have a larger water absorbing area in heavy soil than Anjou."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, East Wareham, Mass.

"The harvesting of berries from our experimental spray plots was completed this week," he states in the report of the Cranberry Disease Field Laboratory for September 26th. "The yield of plots of Early Black on the State Bog is of particular interest.

"On some of these plots copper resinate in pine tar oil which was then either mixed with kerosene or made up as an emulsion in water was used as a spray in comparison with bordeaux. Marked injury to the vines was observed on plots sprayed with the pine tar oil-resinate mixture particularly when made up in kerosene. It appeared at the time that the yield might be cut to half or less of that from check plots or from plots sprayed with bordeaux. However on harvesting the berries the yield was found to be only a little less than from check plots with the pine tar oil resinate in kerosene spray showing a somewhat better yield than when used in a water emulsion. It is not possible at this time to make any decision as to the effect of these sprays on reduction of rot.

"The amount of rot present in berries at picking time has been determined in two series of plots on separate bogs. The berries from one of these bogs are of a variety which rots very badly. Sulfur was tried against bordeaux 6-2-50 on this bog. Bordeaux controlled the rot much better than sulfur reducing the rot to about one-third of that in check plots while in plots sprayed with sulfur the amount of rot was one-half to two-thirds as much as in the checks."

He had written September 22: "The main work of the week has been securing cranberries for storage tests from experimental spray plots. Samples have been taken from two series of plots and from about two-thirds of the plots in a third series. The plots in this third series show a hold-over effect on yield which will have to be taken into consideration along with other factors. Plots sprayed with bordeaux last year show considerably higher yield than those not sprayed. No difference could be noted in the yield of plots dusted with copper-lime dust last year as compared with untreated plots but this will be checked later when we have more time to go over it carefully.

"The tail-end of the hurricane which passed up along the Atlantic Coast last week struck us Friday. We had 6.09 inches of rain in the 24 hours from 8 a.m. Friday to 8 a.m. Saturday. This is one of the heaviest rainfalls recorded at this station. A few bogs were flooded by it for 18-20 hours but no particular damage was done. Even this very heavy rain failed to bring some of the ponds to normal water level."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Fruit and Vegetable Storage and Utilization Investigations (J. M. Lutz)

"Examination and canning of our main lot of Kieffer pears was completed this week," says the report for October 3. "The influence of ripening temperature on the quality and texture of this fruit has attracted considerable attention. Kieffer pears ripened at 60°F. were mellow in texture and eating quality was as high as the anatomical features of the pear would permit. The rather thick skin and large core are too much even for a physiologist to overcome. Nevertheless, this variety of pears ripened at 60° F. was mellow and had much finer flavor than Kieffers are supposed to have. Those ripened at higher temperatures developed considerable decay and were tough and woody, as is characteristic of this variety. Although the Kieffer even when properly ripened is slightly inferior to the Bartlett, it must be remembered that the latter cannot be grown in this section of the United States because of ravages of the blight. Since the Kieffer can be successfully grown with a reasonable amount of care, the significance of the much better ripening at 60°F. is immediately apparent."

He had written September 26: "Most of the week was spent in calculating data on the relationship of composition to quality of Concord grapes and the influence of the leaf area on the vines and the leaf area-fruit ratio to these factors. There was a very close direct correlation between sugar content and sugar/acid ratio and quality. Perhaps even more interesting, however, was the direct relationship of leaf area per vine and leaf area/fruit ratio to sugar content and quality. All vines with high leaf area produced high quality grapes with the exception of some vines that had a low leaf area/fruit ratio.

"The records referred to above were obtained from the planting of Concords on various rootstocks. Although it is too early to determine the relative value of the various rootstocks, it is evident that many of the rootstocks will prove superior to own-rooted material, the latter in all cases having poor vigor, low leaf area, low leaf/fruit ratios and bearing fruit low in sugar content, low in sugar/acid ratio and poor in quality."

George P. Hoffman wrote September 12th that the absence of rain with resulting unfavorable growing conditions continued to retard the growth of late planted summer cover crops. "However, it is most interesting to observe and mention that crops growing on previously cover-cropped areas are suffering much less than crops being grown on areas which have not been cover-cropped," he comments. "Retarded growth in sections of the pecan orchard in which heavy cover crops have been turned is much less conspicuous than in sections where the crops turned in have been light."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg. (Prune Russet)

"During the latter part of the week ending September 26th, a visit was made to a prune packing plant at Eugene, Oreg., where I had the chief inspector grade several small lots of dried prunes containing russet spots of various sizes. I selected these prunes at harvest time from an Italian orchard near Dallas, Oreg. and tentatively graded them according to the size of the russetted areas and to the probable cause as determined by comparison with experimental material. The most significant thing about these results is the large percentage of rejected or cull prunes in the badly russetted classes, which comparison with experimental material indicates as being due to abrasions from rubbing against limbs. On the other hand, all prunes in the slightly russetted class (spots located at apical end), which comparison with experimental material indicates as being due largely to the feeding of thrips, passed without any rejections. These data give further confirmation to the view that thrips are not concerned to any significant extent, if at all, in the production of the type of russet which results in rejection of the fruit as culls.

"Most of the week ending September 19th was spent in taking final results of our current studies on prune russet. While judicious pruning is helpful in reducing the incidence and severity of russet, it will not entirely control the trouble, since the type of pruning necessary to reduce the amount of russet to an insignificant quantity cuts the crop so sharply as to be prohibitive. Thus, in one Italian prune orchard located near Corvallis, Oreg. 293 pounds of fruit (green weight) were harvested from a representative unpruned tree, while only 126 pounds of fruit were harvested from an adjacent pruned tree--or, in other words, there was about 2-1/2 times as much fruit on the unpruned tree as on the pruned one. As to the russet situation, approximately 5-1/2 percent of the fruit from the pruned tree was badly russetted, while approximately 11 percent on the untreated tree was affected sufficiently to warrant rejection as culls. The establishment of wind breaks about the orchard, particularly on the windward side, appears to be a more promising method of control, as is indicated by the fact that the erection of an experimental wind break about an individual tree in an Italian prune orchard near Amity, Oreg. reduced the incidence of badly russetted fruit from 20.7 percent to about 3 percent."

Commenting on results of cross inoculation studies carried on in the greenhouse in the winter and spring of 1936, he says: "In some of these series well defined lesions were produced on fruits of *Juglans regia* growing on potted trees by spraying on water suspensions of the filbert blight pathogene. The lesions were indistinguishable from these produced by the walnut blight bacterium (*Phytomonas juglandis*). The results of these studies give additional support to the view that walnut bacteriosis and filbert blight are caused by very closely related, if not identical, organisms."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"Two or three weeks ago the report was made in one of our weekly letters that defoliation of pecan trees was taking place rapidly," he comments in his report of work at the U. S. Pecan Field Station and Laboratory for the week ending October 3, "Since that time we have received fine rains and the defoliation has almost stopped except in the orchards where the trees are old or crowded or have had no care. As a result, the trees will go into the winter in much better condition than thought possible at that earlier date....

"From all reports and from observations, pecan harvest is still about two weeks off. However, the jays and crows are beginning to gather for the feast and a few shucks have already been found with the nuts missing. We think it may be necessary to declare war if this situation gets too bad and do as many orchard owners do who make it a regular practice to keep a man in their orchards equipped with a shotgun to keep the birds away. Losses from this source sometimes reach rather respectable amounts."

He had written September 26th: "The chestnut harvest continues but will soon be finished, with only three or four late ripening trees yet to be harvested. There have been several trees each producing 40 or more pounds of nuts this year. Some effort has been made to work out a system of harvesting which will make the handling of the burs less laborious. The use of a corn sheller has not been satisfactory but a crude machine of the cylinder and concave principal run at slow speeds appears to have promise. For the present, such a machine is desirable but there is sufficient variation in the seedlings to allow the selection, in the establishment of varieties, of trees which shed the nuts and burs separately. Much interest is being manifested in the chestnuts and several men are anxious to obtain nuts for planting. There are some handling and storage problems which need solution, and a market must be developed, but with all the future appears bright.

"The meetings of the National Pecan Growers' Association, held in Albany on the 23d and 24th, were fairly well attended with the States of Georgia, Florida, South Carolina, Alabama, Louisiana, and Texas being represented. Much of the discussion centered around marketing, cover crops, the grower's problems, and livestock in relation to pecan orchards and as a whole was of much value. A free barbecue was given at noon of the second day by the members of the local pecan distributing companies. The afternoon of the second day was taken up with a trip to various experimental plots under the direction of Mr. J. R. Cole and the writer. This trip appeared to meet with much favor and many questions were asked."

NUT INVESTIGATIONS

J. R. Cole, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory on October 3, he says: "On Saturday I drove to Fort Valley, Ga. and conferred with Dr. Hutchins. In the afternoon I visited a number of pecan orchards and advised growers concerning the control of scab. Most of these orchards are planted to the Schley variety with an occasional tree of the Georgia Giant or Delmas variety among them. These latter varieties are scabbing severely and the scab is now spreading to the Schley varieties. In some of these orchards scab has destroyed at least 10 percent of the crop of nuts. My advice to these growers was, first, to cut out and destroy the Georgia Giant and Delmas varieties, and, second, to practice sanitary measures, i.e. destroying all old shucks, leaves, etc. Some of these orchards will produce at least 1,000 pounds of Schley nuts per acre and these nuts have been sold, locally, for 18 cents per pound, tree run....Practically every day requests come in for information on scab control. There are three reasons for this, first there is a good crop of Schley nuts; second, the scab disease is worse than it has been for several years; and, third, prices for the Schley nuts are better than they have been for several years."

Howard E. Parson, Shreveport, La.

"Sprayed trees now have a better appearance than unsprayed trees," he writes October 10th. "It is not thought that attack of parasitic diseases has been severe enough to account for their better appearance, but that there has been an appreciable amount of stimulation and greening of foliage caused from spraying with bordeaux mixture, whether it be with 2-1/2-50 or 4-1-50."

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

"Good progress has been made in harvesting the experimental plots, although some delay was experienced this week because of rain," he writes October 3d. "Several more days will be required to finish this work. The harvesting of the commercial crop in this county is not as far along as it usually is at this date. This is due chiefly to the lateness of the season and to bad weather conditions. The potato market has been rather weak recently. The price paid the grower has dropped from $2.00 to $1.65 to $1.75 per barrel.

"Light frosts have occurred," he wrote September 19th, "but we have had none of sufficient severity to completely kill the potato vines. In the commercial fields the early crop is being dug. The late varieties are still immature. The market is rather dull, the prices paid growers ranging from $1.75 to $2.00 a barrel."

ADMINISTRATIVE NOTES

Tracing Checks

A field party, caught in a heavy rain, sought shelter in the nearest house. They noticed in the room an antique grandfather clock. "Your clock doesn't keep very good time," said one of the party, jokingly, to the owner of the house. "Oh, there is nothing wrong with the clock," said the farmer, promptly. "It is you who don't understand. When that clock's hour hand is straight up and the minute hand straight down, it strikes ten, but it is really five o'clock. After that you only have to calculate."

Judging from the few who follow the correct procedure, we are beginning to think our employees believe they just have to calculate how to handle the matter of lost checks. The procedure, however, is really quite simple. All that is necessary is to have a letter signed by the payee. The Treasury Department will not honor a request unless it is accompanied by such a signed letter. If a company is the payee, then the letter must be signed by the person who usually endorses the company's check. The Treasury requires this signature so that it may be compared with the endorsement on the check in case the latter has been cashed.

You will follow the straight line, then, and save time at both ends by making sure when there is complaint of non-receipt of check and sufficient time has actually elapsed for payment to have been made, that signed letter from payee (in triplicate, two copies signed) is sent to us with necessary information to identify the voucher and check involved. If you fail to do this, we must write back to you for such signed letters; the complaint can't go ahead without them.

Automobile Mileage

It is said that when statisticians wish to figure the population of a Swiss village they merely count the number of echoes, and divide by the number of mountains. The General Account Office is a good bit more fussy about the manner in which you arrive at your mileage when operating a personally-owned automobile on Government business.

The new forms, 1012-e, have been received and sent to all employees likely to need them. If you have occasion to use your personally-owned automobile for official work and haven't received these new forms, write to the Business Office for them at once. The General Accounting Office is suspending mileage claims which are not sent in on this new form--so please destroy any of the old forms you have on hand to prevent their accidental use.

ADMINISTRATIVE NOTES

Delays-Damages In his memorandum of September 17, 1936. "Purchases-Orders-Supplies, "Roy Gillette promised to advise you promptly in case of changes in the regulations. Here's one! Beginning immediately and until further notice, the following paragraph must be made a part of all specifications for bids:

"Delays - Damages. - If the bidder who receives an award under this advertisement (hereafter referred to as 'contractor') refuses or fails to make deliveries of the materials or supplies within the time specified for the item or items awarded him, or any extension of such time, theGovernment may by written notice terminate the right of the contractor to proceed with deliveries or such part or parts thereof as to which there has been delay. In such event, the Government may purchase similar materials or supplies in the open market or secure the manufacture and delivery of the materials and supplies by contract or otherwise, and the contractor shall be liable to the Government for any excess cost occasioned the Government thereby: Provided, That the contractor shall not be charged with any excess cost occasioned the Government by the purchase of materials or supplies in the open market or under other contracts when the delay of the contractor in making deliveries is due to unforeseeable causes beyond the control and without the fault of negligence of the contractor, including, but not restricted to, acts of God or of the public enemy, acts of the Government, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, and delays of a subcontractor due to such causes unless the contracting officer shall determine that the materials or supplies to be furnished under the subcontract are procurable in the open market, if the contractor shall notify the contracting officer in writing of the cause of any such delay, within 10 days from the beginning thereof, or within such further period as the contracting officer shall, with the approval of the head of the department or his duly authorized representative, prior to the date of final settlement of the contract, grant for the giving of such notice. The contracting officer shall then ascertain the facts and extent of delay, and his findings of fact thereon shall be final and conclusive, subject only to appeals within 30 days by the contractor to the head of the department concerned or his duly authorized representative, whose decision on such appeal as the facts of delay shall be final and conclusive."

The above paragraph may be written into the specifications or may be attached to each copy of the specifications and referred to in the body of the specifications as follows: "The attached sheet headed "Delays-Damages' is a part of this specification." The Business Office has copies of this paragraph and can furnish a few to those members of the field force who are likely to have occasion to issue bids in the field.

Vol. 8 No. 21 November 1, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I M O N T H L Y N E W S L E T T E R .

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. VIII Washington, D. C., November 15, 1936 No. 22

Freezing Preservation of Vegetables

Some of the work of this Division deals with subjects in which there is such a degree of interest and such a demand for dependable information that immediate publication through the medium of technical outside journals of the results obtained is desirable. This is the case with the fairly extensive studies of the freezing of vegetables, carried on cooperatively by members of our fruit and vegetable utilization and the handling, transportation and storage sections. These studies have dealt primarily with the comparative suitability of varieties for freezing as grown under Eastern conditions, a subject upon which information has been notably lacking. For this reason the results obtained in two years of work carried on at Arlington Farm have been published as a series of articles, each dealing with results obtained with one vegetable and each complete in itself in that methods of preparation and handling of the material are so fully described that the paper might serve as a guidebook for those interested in packing the material discussed.

The same general basic methods were employed throughout the work in that the raw materials were all grown under uniform conditions under the immediate supervision of the writers and that harvesting, preparation, grading and packing were done by them personally to insure uniformity in treatment. As one of the purposes of the work was to ascertain the effects of stage of maturity of the material upon its behavior in freezing and upon the quality of the product when subsequently prepared for the table, all material was carefully graded for maturity and all the commercial grade sizes of peas, lima beans, etc. were separately packed and examined. Duplicate packs with and without the addition of brine were made throughout and both non-airtight paper and sealed tin containers were used.

As there is considerable interest in the possibilities for freezing vegetables in larger sized containers for hotel and institutional use, packs in five-pound and ten-pound containers were made and the material compared with that preserved by identical methods in one-pound packages. The results demonstrated that the use of the larger packages is perfectly feasible if the conditions of packing and handling are properly controlled. The method of freezing employed with all material was of the "slow" type, in that the products as packed were frozen by transfer to a room held at 15°F. where the packages were placed in the current from an electric fan. After a few days at 15° they were transferred to storage at 0°F. where they remained until removed for examination five to seven months later.

"Comparative Suitability for Freezing Purposes in 14 Varieties of Garden or Snap Beans grown under Eastern Conditions," by H. H. Moon, Joseph S. Caldwell, J. M. Lutz and C. W. Culpepper, appeared in The Canning Age for June and July, 1936. The 14 varieties used were grown together under uniform conditions for three seasons, graded into three different stages of maturity, and packs of each grade were made with and without addition of brine in all the types and sizes of containers just mentioned. When examined after seven months storage and scored on appearance and color in the frozen condition and on color, texture and flavor after cooking, three varieties, Giant Stringless Green Pod, Mosais Resistant Green Refugee, and Kentucky Wonder, were clearly superior to all others in general average on all factors considered in the scoring.

Four varieties, Asgrow, Stringless Green Pod, Burpee Stringless Green Pod, U. S. No. 1, and Round Pod Kidney Wax, were generally equal to the first group in texture and flavor but were not quite equal to them in retention of fresh, attractive green color, especially in the older stages. Packs of excellent appearance and of high table quality could be made of these varieties by carefully grading out older, lighter-colored beans.

A third group consisting of Asgrow Stringless Valentine, Konserva, Tendergreen, Tennessee Green Pod, and Keeney Improved Kidney Wax, were not equal to the first two groups in any respect; none of them were particularly outstanding or appealing in flavor, all except Konserva became somewhat tough and woody in texture as soon as the seeds developed appreciable size, some were somewhat stringy, and all became somewhat unattractive when cooked because of browning or bleaching of color. Two varieties, Full Measure and Black Valentine, were very definitely unsuitable for freezing purposes, and the authors recommend that the use for freezing purposes of these or of the varieties placed in the third group be avoided.

Effects of various preparatory treatments and methods of packing, as well as of stage of maturity of the material, upon the products are described in detail. There were no consistent differences in appearance or quality of originally identical material packed in airtight and

non-airtight containers, and preservation of quality and appearance were as satisfactory in larger containers as in small. The chief differences between packs prepared with and without addition of brine was that there was greater splitting of pods in brine.

"A Study of Suitability for Freezing Purposes in 18 Varieties of Peas Grown under Eastern Conditions," by H. H. Moon, Joseph S. Caldwell, and J. M. Lutz, appeared in The Canner for July 4 and 11, 1936. The peas discussed were graded into all the sizes possible to obtain by the use of standard sieves and the various sizes were separately packed after scalding for periods adjusted to size and stage of maturity of the various lots. Packs with and without brine were indistinguishable in color and quality when cooked. In the raw condition the brine packs consistently showed somewhat better preservation of fresh, natural green color. Both non-airtight paper and sealed tin containers were perfectly satisfactory, and preservation in the largest size (10-pound) containers was excellent. The number of varieties employed was comparatively limited, but they were so chosen from the larger number concurrently employed in canning studies carried on by C. W. Culpepper as to fairly represent the various groups and types of garden peas. Most were selected for high table quality, but a few, like Alaska, were included because of their extensive cultivation. When graded after seven months' storage, Thomas Laxton and Asgrow No. 40 were of exceptionally satisfactory quality; color was well retained even in the largest sizes, which were free of starchiness, and the smallest sizes were without bitterness or astringency. Texture and flavor were excellent in all sizes, so that high-quality packs could be made from these varieties without grading. Onward, Dark Podded Telephone, Alderman, and Laxton Superb formed a second group from which packs comparing very favorably in appearance and quality with the first two varieties could be made by grading to remove the larger sizes, which become somewhat starchy and deficient in flavor.

A third group made up of Green Admiral, Market Surprise, American Wonder, Improved Pilot, Improved Stratagem, and Nott Excelsior had the same defects of loss of flavor and development of firmness and starchiness in the larger sizes in more pronounced degree than the second group, hence required rather drastic grading to permit production of a pack of highest table quality. As a group they had less uniform green color in the frozen condition and underwent more loss of color and browning on cooking than did members of the first two groups, but were entirely acceptable in flavor and quality when properly graded to removed undesirable sizes. A fourth group, made up of Alaska, Champion of England, Laxtonian, Dwarf Telephone, Pedigree Extra Early, and Wisconsin Early Sweet, were found to be so lacking in all the characters essential to satisfactory freezing material, most notably in desirable texture and outstanding and appealing flavor, that those interested in undertaking the frozen packing of peas are definitely advised against attempts to use these varieties for the purpose.

The authors are mindful of the fact that their material was grown in a region having early summer temperatures too high to be typical of commercial pea-growing districts, but have the feeling that the characteristics of early loss of green color and distinctive flavor and early development of starchiness or the opposite, which make a variety undesirable or desirable for freezing purposes, are fairly constant physiological characters of the varieties, so that the differences between varieties here found would hold broadly true wherever the varieties might be grown.

The third paper of the series, "A Study of Comparative Suitability for Freezing in 35 Varieties and Strains of Sweet Corn Grown under Eastern Conditions," by Joseph S. Caldwell, J. M. Lutz, C. W. Culpepper and H. H. Moon, appeared in The Canner for July 18 and 25 and August 1 and 8, 1936. The number of varieties used was made as large as it was possible to handle with the personnel available in order to include all the older and more widely grown standard varieties, together with a dozen recently developed hybrids and top crosses and a number of older but less widely known varieties of reputed high quality.

The work was continued over two years and both early and late plantings of a number of varieties were made in one year, so that the conclusions are based upon work with two and in part with three crops, all grown at Arlington Farm. For the most of the varieties, lots were packed at several stages ranging from early to late maturity, as whole-grain and cream-style corn and as corn-on-cob, with and without brine, and in several sizes of containers. The exact age from date of appearance of silk of all corn used was known, as all ears in the plots were tagged upon the day of appearance of silk. The results emphasize the fact, long since pointed out by Magoon and Culpepper in their studies of relation of maturity to canning quality in corn, that stage of maturity is of greater importance than variety in determining the quality of the product. When harvested and packed at the optimum stage for use (17 to 20 days from appearance of silks) the frozen material of 10 varieties, 6 yellow and 4 white, was of such uniform excellence that the 10 varieties were placed together as first-rank for the purpose without any attempt to subdivide them in order of excellence. These first-rank varieties were Golden Bantam, Improved 10-14 rowed Golden Bantam, Bantam Evergreen, a Bantam Evergreen hybrid, Top Cross Bantam, Top Cross Whipple Yellow, Narrow Grain Evergreen, Money Maker, Stowell Evergreen, and a hybrid of Stowell Evergree.

A second group of 13 varieties, 5 yellow and 8 white, were excellent products, fully equal to any commercial frozen corns obtainable for comparison, but were not fully equal in all respects to the first group. The differences were in all cases slight and consisted in some instances of less attractive appearance and color and in others of slightly less pronounced and pleasing flavor. The varieties placed in this group included Golden Cross Bantam, Golden Sunrise, Kingscrost Golden Bantam, Top Cross Spanish Gold, Whipple's Early Yellow, Country Gentlemen, two Country Gentleman hybrids, Delicious, Early Crosby, Howling Mob, Long Island Beauty, and Redgreen.

Not all of these two groups were equally well adapted to packing as corn-on-cob, some being undesirable in shape and size, but all were of intrinsically high quality and were excellent for packing as whole-grain or cream-style corn. Two varieties, Early Crosby and Golden Sunrise, received high rank because of quality but were lacking in productiveness and resistance to bacterial blight.

The remaining 12 varieties differed considerably in quality of product and were ranked into three groups in order of decreasing suitability; most of them were dwarf or semi-dwarf early corns not well adapted to the latitude of Washington, D.C., and many of them suffered rather severely from bacterial wilt. They included Burbank's World Wonder, Gold Coin, Golden Giant, Sweet Orange, Narrow Grain Hybrid, Top Cross Country Gentleman, Golden Crosby, Early Fordhook, Mammoth White Cory, White Sunrise, Golden Gem and Golden Sunshine. The authors suggest that their unfavorable showing in this test should not prejudice growers against them in districts to which they are adapted, but that the large number of productive and disease-resistant varieties of high quality in the first and second groups offer a wealth of material for use without employment of varieties which are lacking in these respects. They emphasize also that a large number of the newly introduced hybrids and top crosses were found in these tests to possess very high quality as frozen products.

A careful study of the relation of maturity to the quality of the product was made, its results showing the necessity of harvesting corn for freezing in whole-grain or corn-on-cob form in the first half of its period of usuable maturity, two to three days earlier than would be used for packing cream-style. This is in accordance with the experience of canners packing whole-grain corn, and the reasons are stated in detail. As between packs prepared with and without addition of brine, there was a slight but consistent superiority in flavor of brine packs in all varieties and at all stages of maturity. No significant differences between hermetically sealed and non-airtight packages were observed; there were slight surface changes in appearance due to drying in the latter but the cooked material was identical in all respects. This was also the case for material from large (10-pound) and small (1-pound) containers. In the case of corn-on-cob, some abnormality of flavor was present in portions of the first year's pack and was attributed to insufficient scalding; it was greatly reduced in frequency but not altogether eliminated by increasing the length of the scalding period in the next year, and the authors feel that further extension of the scalding time over that used by them should be made.

As in other papers of the series, the authors emphasize prompt handling of the material at all stages of the preparation and packing, thorough cooling prior to packing, and immediate transfer to the freezing room. Success in freezing corn depends upon rapid and uninterrupted handling of the material from harvesting to arrival in the freezing room and upon strict adherence to methods of handling which are described in detail.

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASES INVESTIGATIONS.

Edwin Smith, Wenatchee, Wash. (Report for October 19-28)

"On October 19 Mr. Ryall came to Wenatchee and, using a single brush-flood apple washing machine, we ran washing experiments at night when the machine was not in use by the owner. Samples of apples from Mr. Newcomer's spray plots were used to determine the efficiency of three treatments over this machine. On the night of October 21 we conducted experiments with a double-process flood machine, and, on the night of October 22 with a single process flood machine in Yakima. During this week we have completed our apple washing program by using a double process machine in Wenatchee. This machine had brushes in the first part and a flood without brushes in the second part. The use of brushes in the Pacific Northwest has largely been confined to the latter type of machine.

"The use of brushes in washing machines, though known to be effective, has been on the wane during the past three seasons because of the expense through rapid depreciation and necessary replacement of brushes. A large amount of light-viscosity mineral oil with hydrochloric acid has been used this season, particularly in Yakima, where some large packers now maintain that double process machines are unnecessary because of this effective treatment. Our experiments for the past two years have developed information on the use of this treatment, though our data also show that this method has an undesirable effect upon the fruit. Excessive removal of natural wax causes shriveling when fruit is held at high temperatures in atmospheres of low relative humidity. Generally speaking, cleaning difficulties were few this season....

"Most of the apple pickings were completed by October 17 and many packing houses in the Wenatchee district had closed down by October 24. Conservative estimates place the apple crop of North Central Washington at 14,000 carloads and of the Yakima Valley at 9,000 carloads. The market remains firm with Delicious at $1.60-$1.65, and Winesaps at $1.50. Shipments have been satisfactory, about 6,000 carloads having already moved from this section."

NUT INVESTIGATIONS

C. L. Smith, Austin, Texas.

"During the week a check-up was made of the pruning experiments in Wolfe's grove at Stephenville," he writes October 17th. "The heavily pruned trees have a fair crop, the thinned unpruned trees practically none. The foliage on the pruned trees is still in fairly good condition; practically all leaves have dropped from the unpruned trees. There is a lot of downy spot in this orchard, but it did not seriously damage the foliage of the pruned trees. Although this is only the second year for this experiment it has been very profitable from a nut production standpoint in both years."

HANDLING, TRANSPORTATION AND STORAGE AND MARKET DISEASES INVESTIGATIONS.

Apples to England. Technical Bulletin No. 523, "Transportation of Apples from the Shenandoah-Cumberland Section to Overseas Markets," by Paul L. Hardingand Charles L. Powell, reports on investigations conducted under the general direction of Mr. Fisher to determine the most satisfactory method of handling and transporting apples to the overseas markets that ordinarily receive the major portion of the crop from the Shenandoah-Cumberland producing section of Virginia, West Virginia, Maryland and Pennsylvania.

Serious losses have at times been experienced in overseas shipments due to development of decay, internal breakdown and overmaturity in transit. "Slack" barrels which arrive on English markets, too, are usually discounted from 25 cents to as much as $2.00 in price, depending upon the degree of slackness. This condition of the barrels may arise not only from improper packing at the orchard but also from the development of decay and internal break-down after packing.

The effects of low temperatures in retarding the growth of rot organisms and the physiological activity of the fruit are the basis of the common recommendation that apples be placed in cold storage immediately after picking. With each degree rise in temperature there is an increase in the metabolic activity of the fruit itself and, up to certain limits, in the growth of decay organisms, each of which has optimum ranges of temperature as well as maximum and minimum limits for growth. At temperatures above 70° F. apples ripen very rapidly and respiratory activity is high.

The studies reported on were effective in securing information concerning the air and fruit temperatures occurring throughout the entire period of transportation from orchard to destination; and regarding the effect of transit conditions upon the development of decay, physiological breakdown and maturity as indicated by pressure tests and slackness of pack.

Apples shipped under refrigeration from points in the Shenandoah-Cumberland section via New York to England arrived at destination practically free from decay and in the best condition. Apples shipped without refrigeration were usually ripe upon arrival, with varying amounts of decay and sometimes internal break-down as well. The investigations indicate that the extra cost of refrigeration aboard ship or shipping fruit under refrigeration the entire distance from Virginia to Liverpool during early fall at least, will be more than compensated for by the higher sales returns. On one occasion, for example, U. S. No. 1 Jonathans, refrigerated, were selling at from $5.46 to $5.93 per barrel, while Jonathans from ordinary stowage were bringing but $4.18 to $4.96. And, of course, American prestige and reputation is better maintained and enhanced if every effort is used to supply a high standard product.

NUT INVESTIGATIONS

Atherton C. Gossard, Meridian, Miss.

"Twig girdlers are the worst for the time of year that we have ever experienced in this section," he reports October 17th. "Some of our largest and most promising trees have been as much as 50 percent pruned by these girdlers. The cut off limbs have been picked up and burned and areas in which water hickory and persimmon sprouts are growing have been cleared back well away from the pecan orchard...."

He reports something new in methods of selling chestnuts. A very high quality of chestnuts are being gathered from native forests and sold in the local markets at 15 cents for 100 nuts!

J. R. Cole, Albany, Ga.

"I have never seen such interest in our work," he writes. We have had numerous requests for information on scab control and during the past week (October 11-17) growers came from as far as Warm Springs on the west and Atlanta on the north to see what we are doing in the way of scab control. Growers show especial interest in the experiments in the Palmyra and DeWitt orchards."

B. G. Sitton, Shreveport, La.

Reporting on the cutting of the summer legume cover crop at Robson some weeks ago he gives the average green weight per acre as 10,930 pounds on one plot and 14,630 on the other. Weeds and grass interfered considerably with the growth of the velvet beans this year. The plots were moved one middle to the west. The middle that had cotton on it last year and was given clean cultivation produced 15,100 pounds, while the middles that had a summer cover crop of crotolatia last year without cultivation produced only 9,100 pounds per acre this year. This indicates the necessity for keeping down weed growth.

POTATO INVESTIGATIONS

C. F. Clark, Presque Isle, Me.

Writing before leaving for Washington the end of October, he says: "We have finished harvesting the potatoes on the experimental plots and for the past few days have been putting up material for shipment to the cooperative stations. As the result of frequent rains there have been many delays in harvesting. The season has been regarded as the most unfavorable for harvesting crops known for years....There has been a considerable increase in the certified seed acreage in Maine of two of the Department's new potato varieties, Katahdin and Chippewa, 800 acres of the former and 300 of the latter having passed the certification inspection this season. Forty-six thousand bushels of these varieties have recently been purchased by the Argentine government for seed purposes in that country."

NUT INVESTIGATIONS

C. E. Schuster, Corvallis, Oreg.

"The walnut harvest has been a very unusual one in many ways," he writes October 24th. "The husks cracked or opened to a certain extent and then with the dry warm weather we have been having the husks simply dried on the nuts and most of them hung on the tree for a considerable time after they should have come down. Where people had a good crop, they shook off the nuts and harvested as usual. In some cases the owners have yet to start their harvesting.

"The walnut crop is decreasing in tonnage as the government has revised its estimates downward, and from the way many crops are grading out there will be a still further downward revision. Crops that had looked very good so far as could be told six weeks ago, are turning out a large proportion of light nuts and shrivels....On the other hand, the filbert crop is going over expectations and the government has revised its estimates upward quite considerably. Some packing house managers figure that the tonnage will be very near that of the walnuts so far as saleable tonnage is concerned."

Paul W. Miller, Corvallis, Oreg.

"Results of walnut spraying experiments for blight prevention show that timely spraying with bordeaux mixture results in a cleaner crop of nuts, the percentage of culls, misshapen and blight-spotted nuts being sharply reduced by proper spraying. Thus, in studies carried on in a Franquette orchard near Schools, Oreg., it was found that there were approximately 5-1/2 times as many culls, due to infected kernels, blight stains on the shells and diseased parts of the husk adhering to the shell, in a representative sample gathered from an untreated plot as in a sample obtained from a bordeaux sprayed plot. Moreover, there were about 5 times as many misshapen nuts, due to the presence of blight infections in the husk which interfered with the normal development of the shell, in the sample gathered from the untreated plot as in that obtained from the sprayed section of the orchard...."

"Walnut harvest is now in progress in most walnut orchards in the Willamette valley. From all indications the walnut crop in Oregon is going to be very short due largely to a killing of many pistillate flower bearing buds by the freeze which occurred during the latter part of October 1935 and by the blight epidemic which has prevailed this season in most sections of the Willamette valley. Furthermore, the quality of the yield, particularly in many of the hill orchards, is not up to standard, a relatively large percentage of the nuts containing partially shriveled kernels. Sunburn is apparently one of the factors responsible for this condition. Then too, a considerable quantity of poorly filled nuts is believed to be traceable to the freeze which occurred in October 1935. It would seem reasonable to assume that the injured areas in the trunk and crotches has interfered with the free movement of sap with the result that many nuts did not receive proper nourishment."

NUT INVESTIGATIONS

Milo N. Wood, Sacramento, Calif.

"In some orchards the red spider has been bad this year," he writes October 17th. "Several growers have written that the new almond creations 8-31 and 8-32 on trial escaped the spider, whereas on surrounding commercial trees the red spider was very bad. This confirms our experience on the breeding plots that both 8-31 and 8-32 are spider resistant. If these trees bear well in all districts and the nuts come up to the standard, as they seem to at Davis, the new varieties will certainly be valuable additions to the industry.

"Some time has been given to the study of some of the walnut orchards. Throughout the valleys there has been considerable sunburn but the crop in general has been good in yield. I have not had time to interview all growers in the San Joaquin valley who pollinated this year, but from the few I interviewed I conclude that there was a great increase in the artificial pollination practiced by the growers this year."

Max B. Hardy, Albany, Ga.

"Some growers are already delivering nuts of the earlier varieties but where possible we are discouraging this because the nuts are still too green," he reports for the week ending October 17th. "As usually occurs, some lots of nuts are being refused by the buyers because they were harvested too early and have not been properly cured. We do not expect to start harvest to any extent for another week, but expect to be very busy subsequently due to the fact that most varieties are maturing at about the same time this year."

Alton H. Finch, Tucson, Ariz.

Writing on October 24th, he says: "Pecan harvest is now getting under way in the Yuma valley. The crop is light on most varieties but condition of maturity is the best in several seasons. The yield on Onliwon, Millican, and Halbert trees is good, especially the latter which are generally heavily loaded. In spiteof the heavy crop of Halberts this year the nuts are well filled and of excellent quality."

Writing earlier of a visit to pecan orchards in the Yuma valley and his experiments with ethylene treatment in pecan maturity, he reported: "This past week's results seem to leave no doubt but that ethylene is effective in causing pecan shucks to separate from the shell and furthermore it seems to be effective in causing the shell to become a normal brown color."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"Dr. C. D. Schwartze of the Western Washington Experiment Station, and Mr. H. C. Diehl of the U. S. Frozen Pack Laboratory, were here during the greater part of the week and gave very careful attention to the selections," he writes for the October 5-10 period. "Professor Wiegand of the Food Products Industries of Oregon State College also gave most of his time to the examination of these berries.

"A number of strawberry selections were very good, some of which had been good almost continuously in the past four or five years. Chief interest, however, was in the red raspberries where a large number of very fine appearing and fine quality berries were found. The blackberries were principally hybrids from a cross of the native wild blackberry with the Loganberry. The outstanding feature of these berries was their good flavor. They were, however, generally inclined to be a little too small and were often soft. On the whole, the red raspberry material was outstanding while that of the strawberries and blackberries, though good, was not much better than in former years."

H. F. Bergman, Amherst, Mass.

Reporting for the Cranberry Disease Field Laboratory, East Wareham, Mass., for the week ending October 24, he writes: "The first storage test of the season was begun this week and it has kept us very busy getting out the subsamples. Some of the berries are already in very bad condition, some of the check plots showing more than 60 percent rot. Berries from plots sprayed with bordeaux are in the best condition. Among the plots sprayed with bordeaux there is some variation according to the strength of the spray used and the sticker employed. Sulfur spray fails to show any control of rot and in many instances increases it.

"Berries are now all harvested and the usual fall work of sanding, repairing dikes, gates, etc. is in progress. The weather has been very mild to date."

DRIED FRUIT SALES RECORD

Figures just compiled by Western Canner and Packer (October) indicate that during the year ending July 1, 1936, packers of dried fruits in Washington, Oregon and California shipped a total of 551,113 net tons, the largest movement so far recorded and what is believed to be one of the three heaviest shipping tonnages in the history of the industry. Prunes led the parade, Northwest and California operators moving 265,000 tons during the 1935-36 year. Raisins were second, with 183,969 tons, and apricots were third, with 26,029 tons. This sales record is truly remarkable, especially when it is considered that the 1935-36 pack did not enjoy anything like its usual market in Germany.

--Daily Digest.

REPORT ON SMALL FRUITS, BELTSVILLE, MD.

"Emphasis has been placed on propagation of many of the more promising strawberry selections this year at Beltsville," writes Dr. George M. Darrow. "A field estimate of the number of plants per 50-foot row was taken August 28 and again October 3. Strawberry nurserymen in this region take a plant-stand record at the end of August, when the record can be fairly easily taken, and then expect the number of plants to double during September. The number at the end of September determines the approximate total of plants large enough to sell the next spring.

"Our records this year corroborate the nurserymen's experience. Some more than doubled the number, others did not. Thirty-six of the more promising ones of which propagations were desired had about 4,135 plants on August 28, the number having increased to about 8,850 plants on October 3. A thirty-seventh selection which had a dense stand on August 28 of about 1,000 plants had no increase in number on October 3.

"The plant increase record for 12 of the most promising selections (designated by numbers) follows:

U.S.D.A. No.	Aug. 28	Oct. 3
1631	100	200
2061	400	500
2100	0	10
2118	15	60
2119	30	50
2120	75	100
2123	200	300
2124	50	140
2125	100	250
2126	100	200
2127	50	250
2183	300	500
Total..	1420	2590

"Some records on the value of lath and screen shade are still more interesting to us. Some 20 plants of our N.C. 669 (Blakemore x Fairfax) were set in the field last spring and five plants of the same number in a wire-cloth shade house. Seven of the field plants died; the remaining 13 made 214 runner plants or about 16 per mother plant. The five plants under shade have made a dense stand estimated at 300 per mother plant or about twenty times as many. The 50-foot row (more than 25 mother plants) of the U.S.D.A. 2127 made about 250 plants in the field, while seven plants in the shade house have made about 600.

"We have had similar experience at the Coastal Plain Station, Willard, N. C. Two 200-foot rows of N. C. 669 in the field had made 811 runner plants by September 4, or about 8 per mother plant; while in the lath house there we counted 156 per mother plant. The use of shade during very hot weather has helped in propagating many selections this year. We have even used the shade to get propagations of two blackberry selections. They both root much more freely at the tips under the shade.

"Last winter half of each row of some 150 selections and varieties was partially protected by a light mulch of millet and soy-bean hay. Later, temperatures of at least -10° F. occurred, and winter injury was severe. Some of the results of injury last winter were: (1) Killing entire plants; (2) killing primary crowns; (3) killing all fruit-buds; (4) killing fruit-buds in primary crowns; (5) causing multiple fruits; (6) browning the crown centers; (7) killing the base of the crowns; and (8) killing or injuring roots.

"Losses heretofore laid to root-rots and leaf-scorch were entirely prevented by late-fall mulching. Because it was so very evident that winter injury to strawberries was of major importance last winter at Beltsville and that it affects the industry in many unsuspected ways, examinations are already being made of crowns and the first mulching for winter protection has already been done--October 6."

----- ADMINISTRATIVE NOTES -----

Injuries to Employees. The Federal Employees' Compensation Act does not discriminate between aliens and citizens or between residents and non-residents of the United States. Aliens resident or non-resident qualifying as civil employees of the United States are entitled to the full benefits authorized by the compensation law. Employees of the United States injured while in the performance of official duty outside the United States are also entitled to the full benefits of the compensation law.

Temporary workers, including those employed under letter of authorization, are entitled to the benefits of the act. It is suggested that injuries to persons employed locally under letters of authorization be reported in somewhat more detail than in the case of permanent employees, showing the circumstances under which the injured person was employed and the authority under which the agent of the Department engaged the services of the injured person.

Use the regular compensation form for reporting injuries to both permanent and temporary employees. If you have none of these forms, a small supply may be obtained from Mr. Gillette.

Vol. 8 No. 22 November 15, 1936

THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R.

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

This News Letter is for distribution to employees of the Division only, and the material contained in it is of an informal and confidential nature, and is not to be published without securing the prior approval of the Division of Fruit and Vegetable Crops and Diseases. The reports of field workers and others represent, of course, their personal opinions, and so are not necessarily the official and final word on the subjects.

Vol. VIII Washington, D.C., December 1, 1936 No. 23

Katahdin and Chippewa head Another list!

A man walking with a friend from Scotland along the London streets, raised his hat as he passed Westminster Cathedral. Somewhat to his surprise, he noticed that the Scotchman lifted his hat also. "You're getting to be pious," he said; "raising your hat when passing the Cathedral." The Scotchman appeared somewhat astonished. "Was that the Cathedral?" he asked. "I though it was the Bank of England."

What I mean is that you will not be making a mistake in raising your hat to the Katahdin and Chippewa potatoes--they're heading another list. This time a Commission from Argentina sent here to secure the best certified seed potatoes for that country ranked our two new hybrids at the top of their list. The Commission purchased more than 40,000 bushels and would have taken more had they been available. It appears quite likely that this initial purchase may open up a permanent market for American seed potatoes. We'll be ready, for as Dr. Clark told us in the last issue there has been a considerable increase in the certified seed acreage in Maine of the Katahdin and Chippewa, 800 acres of the former and 300 of the latter having passed the certification inspection this season. Too, most of the 500,000 bushels--yes, we said 500,000--of Katahdin grown in Michigan in 1935 were kept for the 1936 planting.

An even more encouraging feature of the progress of these new potatoes commercially is that in spite of the fine showing made by the Katahdin, the Chippewa gives every indication of surpassing it, since it appears to be more widely adapted, while keeping step in quality. And down in Louisiana they are swearing by--not at--the Houma, another of our potato creations. More of that later!

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"The weather during the past week has been cold with temperatures each night ranging from 22 to 27°F. and usually accompanied by considerable fog during the night and early part of the day," he writes on November 14th. "The dry weather has continued later into the fall than in any other season on record. The low temperatures seem to have caused some damage to walnuts but so far as external observations are concerned there seems to be no appreciable damage to small fruits. However, unrotted tips of trailing brambles are killed back from 6 inches to a foot or more from the ends."

He had written earlier: "A trip was made to Puyallup, Wash. where on October 19th a large number of red raspberry selections of the Western Washington Experiment Station were examined for their quality in the frozen pack and also canned. Washington No. 89 was the most oustanding of the canned selections. It is also their heaviest yielder--a cross of Cuthbert x Lloyd George. Washington No. 76, Lloyd George x Latham, was the outstanding selection in the frozen pack, being of a very fine color, exceptionally attractive, and of good flavor.

"Blueberries in frozen pack were also examined. The June was the outstanding variety in the frozen pack. Concord was also good, while Jersey, Harding, Ruble, Katherine, Pioneer, Rancocas, and Cabot were fairly good. Grover, Adams, and Sam were rated as poor.

"Joy and Mersereau blackberries were better than Brainerd and Texas in the frozen pack."

H. F. Bergman, East Wareham, Mass. (Cranberries)

Writing from Amherst on October 31, he says: "The percentage of rot has been calculated for most of the plots and columnar graphs have been prepared for two bogs on which rots were very bad.

"On one bog of Early Black the amount of rot on October 1 ranged from 20 to 26.5 percent and by October 22 this had increased to from 30 to 40 percent. Bordeaux sprays generally reduced the rot to 10 to 15 percent, on October 22.

"On another bog of Middleboro berries we found up to 45 to 50 percent of the rot on October 2, and from 60 to 68 percent on October 21. Here bordeaux reduced the rot to 15 to 22 percent on October 21.

"Berries were gathered from a cross of McFarlin x Shaws Success made in 1932. The seeds from these berries will be planted early next year to study segregation in the seedlings."

DECIDUOUS FRUIT INVESTIGATIONS

Circular No. 405, "Susceptibility of Grape Rootstocks to Root Knot Nematode," by Elmer Snyder, is being distributed. This nematode (Heterodera marioni (Cornu) Goodey) is fast becoming one of the important destructive pest diseases of Vitis vinifera varieties of grapes. Under favorable soil. moisture, and temperature conditions, the root knot nematode causes a decided weakening of growth and a rapid decrease in production in vinifera grape vineyards, especially on sandy soil.

"Commercial vinifera vineyards have been seriously injured by root knot nematodes," says Mr. Snyder in his summary. "From the tests described, 154 varieties of Vitis vinifera were found to be susceptible to root knot infestation. Very heavy infestations occurred on all vinifera varieties even during one growing season when the vines were planted in nematode-infested soil....The majority of the American species and hybrids included in these tests were too seriously affected to be considered of further value as nematode-resistant stocks. None of the stock varieties were found to be immune to nematode attack. However, tests indicate that certain grape species may have some inherent resistance...."

Some of the stock varieties and their hybrids were only very slightly affected and appear sufficiently resistant to nematode attack to merit commercial trials, he finds. Dog Ridge, Salt Creek, and Solonis x Othello, no. 1613, have been selected on account of their vigor and general adaptability for further trials.

G. A. Meckstroth, Willard, N. C.

"I cut the stolons on a number of grafts which I have made in the field," he writes on October 31 concerning strawberry disease investigations at the Coastal Plain Station.

"These plants have developed good root systems and will be transplanted a little later where they can be watched through next season. To date there is no indication that the Blakemore yellows is transmitted by means of stolon grafts."

John C. Dunegan, Fayetteville, Ark.

"Orchard surveys were made near Johnsons, Lowell, and Farmington, and it is becoming increasingly evident that the effect of the 1936 drought was most pronounced on the trees that were more than 30 years old," he writes November 14th.....

"The daily range of temperature has been higher the entire week and we have experienced a return of mild fall weather after the touch of winter during the previous week."

DECIDUOUS FRUIT INVESTIGATION

John C. Dunegan, Fayetteville, Ark. (continued)

"An examination of several blocks of trees in the Rothrock orchard near Johnsons showed that the major drought injury occurred in a block of 33-year-old Ben Davis trees," he wrote November 7. "The loss was much less in a block of Arkansas (Mammouth Black Twig) trees of the same age. A block of Delicious and Stayman trees 22 years old showed only an occasional tree affected. Actual figures showing percentage of trees killed in the various blocks will be computed later."

He had written October 31: "The absence of a killing frost so far this season has prolonged the growing period and most of the apple trees which survived the drought are still in full leaf. Some trees, as mentioned in a previous report, have bloomed again this fall but the condition does not appear to be widespread. However, I saw trees during the week with open blossoms so the conditions favoring this type of full growth apparently have continued through the month of October.

"I made a preliminary survey in one orchard during the week to get data on drought injury. This particular orchard suffered very severely from the 1930 freeze but has been kept in a high state of vigor since then and lost very few trees this season. It was very interesting to see how well trees showing very extensive trunk injuries continue to survive the very adverse environmental conditions. Their survival I believe is largely due to the excellent care they have received. Next week I am planning to examine an orchard which has received only indifferent care and I rather expect to find a different picture; at least the grower reports the loss of many trees."

R. B. Wilcox, Pemberton, N. J.

Writing from the Cranberry and Blueberry Disease Laboratory on November 15th, he says: "The sorting of cranberries from experimental plats has been continued in the laboratory. Blueberry fields and prospective blueberry fields have been visited. Where blueberries were not growing satisfactorily there have been two obvious reasons, both of which can be corrected in the fields examined. The most common trouble was lack of sufficient drainage. In certain fields, however, the soil was not sufficiently acid to suit blueberries, and experiments are under way to correct this condition and note the result.

"The weather continues generally mild although there have been several nights of freezing temperature. This will tend to harden the blueberry wood in most fields so that it should stand the winter fairly well. ....Final reports on the cranberry crop of 1936 place the volume at about 60,000 barrels, a reduction of nearly one-third from the pre-season estimate."

DECIDUOUS FRUIT INVESTIGATIONS

M. A. Smith, Springfield, Mo.

The rumor that Dr. Smith was eliminated by grasshoppers proves to be unfounded. From the Ozark Fruit Disease Laboratory, he sends us a summary of activities for September and October.

"As indicated earlier," he writes, "the apple crop in this district will be about 10 percent of normal. Because of this shortage, for the first time in several years the Marionville Cold Storage is not operating. The present supply of apples is being sold on local markets very readily, but indications are that in a short time this district will be forced to depend heavily on importing of apples until the next harvest. Heavy rains which fell the latter part of September caused considerable cracking of fruit though it was otherwise of good quality.

"I have made counts in 25 orchards within the past month and my data show that 15 percent of the trees in these orchards were killed this summer. Of this 15 percent, fully half were infected with blister canker. I also noticed several severe cases of sunburn of wood. Sunburn was more severe than usual this season, particularly in young orchards where severe grasshopper infestation resulted in most of the foliage being destroyed early.

"The grape harvest this season was small, averaging only about 30 percent of normal. Since the rains, the vines are in good shape. It appears now that there will be very few strawberries next summer. According to word from the Frisco Railway, they do not plan on any carload shipping of strawberries next spring.

"Rainfall for the month of September was 3.77 inches above the normal and in October 2.22 inches above the normal. The subsoil moisture has naturally been increased very materially within the past two months. Orchard soils are in very good condition at the present time."

DOUBLED DATE CROP

Business Week for November 7, tell us that the total yield of dates in the Coachella and Imperial valleys of California, largely the former, will be about 7,000,000 pounds for 1936. Just what our work on the date palm is meaning may be judged from the fact that only 10 years ago an annual production of around 1,000 pounds was the limit. Now the experts are saying the production will be 15,000,000 pounds or more in these regions within less than another 10 years. And better dates than the bulk of the fruit now imported in such large quantities. When the investigations under our date project were started, the date palm was merely a botanical curiosity in this county.

THE BOYSEN DEWBERRY (BOYSENBERRY)

A good bit of interest has been aroused in the Boysen dewberry (Boysenberry) and Dr. George M. Darrow has given us a brief outline of its character and possibilities.

The Boysen originally came from central California. Its origin is unknown. Its close resemblance to the Young variety suggests a similar origin, that is, a cross between an eastern dewberry and the Logan or Phenomenal blackberries or a native western trailing blackberry. It is very similar to the Young dewberry and may be best compared with that variety. In southern California where it has been grown commercially for several years, the berries are somewhat larger and longer, more tart, commence ripening nearly 10 days later, and continue to ripen some berries 2 to 4 weeks later than the Young variety.

The plants are fully as vigorous as Young and thus far are as disease-resistant. Plants are propagated in the same way as the Young--that is, by tipping the canes in early fall and from root cuttings. The berries are used in all the ways that berries of the Young variety are used. They are very tart until fully ripe and must be allowed to ripen on the vines for best quality. They are excellent as a fresh dessert fruit, also when canned, preserved, in pies, and for making a fresh fruit drink. Under favorable conditions, 50 of the largest berries fill a quart basket.

The Boysen has been too recently introduced to determine its range of adaptability. Several acres of one-year-old plants were seen in western Oregon in 1936 which bore fully as well as the Young. There was some indication that it might be more productive and a little hardier than the Young under the severe temperature conditions there during the winter of 1935-36. Its later season may make it more valuable under some conditions in Oregon and Washington and less valuable under other conditions than the Young.

At Willard, N.C., one-year-old plants bore more and larger berries and were more nearly free from leaf-spot than plants of the Young of similar age. Their later season and more tart flavor may make them less desirable than the Young as a home-garden berry in the South, but they are desirable as a companion crop to lengthen the season.

At Beltsville, Md., one-year-old plants were injured by temperatures around 10°F. below zero, the plants being without snow cover. However, Young dewberry plants were injured more than the Boysen by these temperatures. The Young is fully hardy 100 miles south of Washington, D.C. and the Boysen may be expected to be hardy wherever the Young is and possibly somewhat farther north.

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASES INVESTIGATIONS.

"Handling, Precooling, and Transportation of Florida Strawberries," a new Technical Bulletin, No. 525, prepared by Dean H. Rose and E. A. Gorman, Jr., surprises a trifle--or does it?--by pointing out that during the 6-year period ended December 31, 1934, the commercial strawberry crop of the United States ranked sixth in size among the fruit crops, being surpassed in carlot shipments by apples, oranges, grapes, peaches and pears.

Because of the long distance which Florida strawberries are usually shipped, their satisfactory marketing necessitates particular attention to handling and shipping practices. Close attention to all phases of the marketing of strawberries is desirable, as a matter of fact, not only because of the size and value of the crop, but because of its perishability. Observations and investigations have shown that under the usual storage or transit conditions the life of strawberries as a marketable commodity varies from a few days to about 2 weeks. The importance of precooling and transit refrigeration, therefore, has been generally recognized.

The bulletin reports on investigations undertaken to ascertain the most satisfactory and economical methods of handling, precooling, and shipping the harvested berries in commercial carlots. Thirty-six carloads of Florida strawberries were used in the tests, conducted in March and April, 1931, February, March and May, 1932, and March, 1935. The results obtained serve as a basis for the following recommendations:

"If fruit is warm when loaded (75°F. or above), as much as 5 percent of salt can safely be used during precooling, provided the precooling period is long enough so that most of the salt will be used up before the car is 'pulled.' In warm weather, if cars are not precooled and move under standard refrigeration, 4 percent of salt can safely be used at time of loading, but at the transit re-icings should not exceed 3 percent. In cool weather, when outside temperatures in transit are likely to go below 32°F., 3 percent of salt is as much as can safely be used during precooling. If precooling brings the bottom doorway temperature within the range, 40° to 45° F., initial icing only will be sufficient for shipments that are likely to pass through freezing temperatures.

"In icing cars for precooling special care should be taken. The ice should not be chopped finer than about 50-pound pieces until within approximately a foot of the hatch bottom. At this point the surface should be piked down level, and fine enough to hold the salt which should then be added. The part of the bunker above the salt should be filled with ice cut into 25-pound pieces. In the hatchways the ice should be cut in smaller pieces and forced under the bridge and around the sides and ends of the bunker. This fills the voids in the upper section and prevents short circuiting of the air over the top."

HANDLING, TRANSPORTATION AND STORAGE, AND MARKET DISEASES INVESTIGATIONS.

High temperatures of the fruit at times of loading are extremely undesirable because they make it difficult to cool the load to a good carrying temperature, consequently strawberries should be picked and loaded as early in the day as possible. It is recommended that strawberries when leaving point of origin should have a temperature of 40°F. or slightly lower at the top and bottom doorway.

Prior to 1929 most of the Florida strawberry crop was shipped in pony refrigerators, but new tariff rates make it more economical now to ship in crates in carload lots so that pony refrigerators are used only for a small volume of less-than carlot shipments. Truck shipment from Florida is practiced to some extent with strawberries but is less important there than in North Carolina and the Chesapeake Peninsula.

NUT INVESTIGATIONS

J. R. Cole, Albany, Ga.

"The most nuts harvested off of any one Schley tree in the Taylor orchard was 78 pounds, coming off of the tree receiving the 3-1-50 bordeaux mixture spray, while in the Palmyra orchard the most nuts harvested was 81 pounds off of the tree receiving the 2-1/2-50 bordeaux mixture prepollination spray application followed by three applications of 3-1-50 bordeaux mixture," he reports November 14th.

"The average number of nuts per tree harvested off of the latter plot was 53-1/2 pounds. Those off of the check trees will be something over 20 pounds.

"I believe that I mentioned in one of my earlier reports, about the middle of July, that scab would probably do a damage of about 50 percent this year in the Albany territory. I think this will prove to be correct."

A. H. Finch, Tucson, Ariz.

"Pecan harvest in the Yuma valley is now somewhat past the peak and will probably be completed by November 14," he wrote for the period October 26 to November 7.

"The crop is very light, but the quality is generally good. The use of ethylene to promote harvest operations has been found more applicable than was originally anticipated. There is no doubt but that it will have a valuable place in commercial harvest operations. Several growers have adopted its use in an elementary way already this season. Other new practices have been developed which give promise of greatly simplifying harvest operations and of improving the quality of the nuts."

NUT INVESTIGATIONS

Paul W. Miller, Corvallis, Oreg.

"The first freezing weather of the season occurred November 2, when the temperature dropped to 22°F. The weather during the first part of November was roughly parallel to that which occurred in 1935 when an unseasonably early cold period occurred during the latter part of October and during the first few days in November. There, are, however, several points of difference in these two cold periods.

"In 1935 a cold north wind accompanied the freezing temperatures, while in the recent cold period there was little or no wind. Then too, in 1935 below freezing temperatures prevailed for six days, while in the current cold period the freezing weather lasted but one day. However, the current cold weather did last long enough to kill practically all tender vegetation.

"Furthermore, it has also injured the new growth on many walnut trees, particularly those trees which were badly damaged by the freeze which occurred in October 1935. The long shoots, or 'water sprouts' coming from the branches and crotches of the winter-injured trees were, in many cases, killed back to the subtending branch. This is particularly true in those cases where all except a very few suckers were removed in midsummer. This is a very unfortunate situation since these shoots were to be used in replacing limbs which have been killed by the 1935 freeze. Fortunately, most of the orchards in the Willamette valley, particularly in the hills, were more nearly dormant this year when the freeze occurred than they were during the forepart of November 1935. For this reason it is believed that the damage will not be so serious or extensive as in 1935."

Reporting on activities for the week ending November 14th, he says: "The forepart of the week was spent in completing current field studies on the effect of spraying walnuts for the control of blight on crop yields.

"Results of these studies show that a paying increase in yield accompanied proper spraying with bordeaux mixture. Thus in studies carried on in a Franquette orchard belonging to Mrs. J. O. Holt near Eugene, Oreg. an average of 99 pounds of nuts per tree was harvested from a representative sprayed plot, while an average of only 71 pounds of nuts per tree was harvested from an untreated plot, the trees of which were quite comparable in size and capacity to those in the sprayed plot.

"In other words, an average increase in field weight of 28 pounds of nuts per tree resulted from spraying with bordeaux mixture in this particular planting."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

"The prices of pecans have not been holding as well as everyone hoped they might," he writes from the U. S. Pecan Field Station and Laboratory on November 7th. "While the purchase price of Schley nuts, strictly A grade, started at 19 cents a pound, the past week saw a decline of 2 cents a pound and another 2-cent decline is expected very shortly. The Schley crop for this section as a whole is running A grade, while other varieties are somewhat lower, many running only a fair B.

"A short trip was made one afternoon with a grower to show him some of our experimental plots. This grower's reaction was that withoug seeing what could be accomplished he would not have believed anyone's verbal description of the results obtained which are so very outstanding this year."

He had written October 31: "While there has as yet been no time to make a comprehensive summary of any of the harvest and sizing records the data obtained on one experiment are so interesting that a few figures will be given here. In the Stuart pruning, spacing and fertilizer experiment in the Taylor orchard the plot having only 10 trees per acre was outstanding, averaging about 28 pounds per tree as compared to about 8 pounds in the next best plot.

"At the same time the nuts from this plot ran about equal oversize and fifteen-sixteenths in size while the other three plots all ran smaller, and size for size there were about 10 or more fewer nuts per pound. Although definite calculations have not yet been made and returns from the 10 trees per acre over a period of five years should just about equal the returns from the best of the other plots which all have 20 trees per acre."

Writing under date of November 14th, he says: "The standard of the crop is generally high both in size and degree of filling. One lot of field run Schley nuts received by a local cooperative ran better than 99 percent A grade, and in size were large or better, many running over-size. In spite of this, or maybe because of this, the price paid to the grower for good Schleys has been dropping about 2 cents a week and is now a little less than 15 cents a pound."

During the first part of the week about one-half inch of rain fell generally over the Albany section, the first rain since about the middle of October. It was welcomed enthusiastically and helped a lot with the cover crops and hastened the opening of some nuts that were not maturing normally.

NUT INVESTIGATIONS

B. G. Sitton, Shreveport, La.

"The nut harvest has been completed, and the nuts sized," he writes from the U. S. Pecan Field Station on November 18th. "Records show that 2,300 pounds of nuts were harvested on the station this year. This is much better than was expected. The larger part of this yield is from trees only six years old. Also, the crop was of good quality."

C. E. Schuster, Corvallis, Oreg.

"A week ago the Morning Oregonian reported that the weather bureau showed that this fall was the dryest since the bureau was established in 1871," he comments in his report of activities for the week ending November 14th. "The whole countryside is very dry. Every night the temperature drops below freezing and in the morning there is usually such a heavy fog that driving is dangerous. Although the general farming or seeding has been done by disking and seeding in the dust, practically none of the fall sown grain has germinated. The small farmer without the heavy power equipment has been unable to do much of anything. The suckers on the trees that were badly winter killed a year ago have again been seriously hurt, in some cases killed back to the trunk. The leaves are dropping now and from these leaf scars there is frequently a fairly steady flow of sap--just exactly the same as occurred a year ago. So far the damage does not seem to have been very much, if any, on mature trees.

"The walnut harvest is completed and the packing house men are in the midst of their grief. The crops coming in, in most cases, are very unsatisfactory and very difficult to grade and handle. Without doubt the next Federal estimate on the walnut crop will be greatly reduced.... The filbert crop has come out much larger than anticipated, but unfortunately the price delivered in the east was set about 2 cents too high. The business looked very good until Italy devalued the currency. Right then the market dropped and has not opened up at all yet. According to the sales managers, a rather heavy carry-over of filberts is to be expected unless some new development comes up. We know one man who refused 14-1/2 cents for 40,000 pounds of filberts, orchard, run, and he was holding for a higher price. Since then he has turned his crop in to one of the cooperatives but into the second pool only, which will mean without doubt a considerable drop in price.

"The competition with the foreign filbert is very serious and cannot be disregarded as was done this year or held as lightly as the growers did who were responsible for increasing the price. The tonnage of small filberts apparently has been very well sold, but the large and medium filberts are very sluggish. The small ones are the ones that can be sold readily in competition with the foreign filbert."

U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISS.

Nut Fruits (Atherton C. Gossard)

"The growth and beautiful dark green foliage of the Mahon variety of pecan in our variety block is evidence of the exceptional vigor of this variety," he reports for the week ending October 24. "The five trees of this variety, all growing in the variety block alongside of less vigorous trees of the same age and size but of other varieties, appear not to have suffered for lack of moisture or any other growth-retarding factor."

Fruit and Vegetable Utilization (J. M. Lutz)

"The Kieffer pears ripened after 30 days storage at 32° were examined and canned during the week. The length of the ripening period at 60°F. after 30 days storage was about two-thirds as long as at the time of harvest. Fairly good results were obtained by ripening in common storage during October. October 10th was the earliest date at which temperatures in the common storage could be consistently held below 70°F.

"Last week while on annual leave, I was in Southwestern Michigan. The demand for Kieffer pears was very good in this section. Several thousand bushels were sold daily. Possibly the results of our work on proper ripening temperatures for this variety of pears might have had something to do with this."

Vegetable Crops (Geo. P. Hoffmann)

"The entire week was devoted to the harvesting of the sweetpotato plots. The yield was some less than would be expected with a normal season. However, the absence of rain, with resulting slow growth, gave nice smooth roots almost entirely free of growth cracks. Several of the seedlings and selections planted in our variety collection for the first time this year gave very satisfactory yields of high quality roots. Selections U.S.D.A. B-25, USDA 029879 seedling, and Wennop gave 257, 245, and 243 bushels per acre, respectively. These selections were conspicuously outstanding, not for the reason of the yield indicated being considered high or satisfactory for a season affording optimum growing conditions, but rather for yielding almost double that of other selections during this unfavorable season--a season of low moisture, high winds and temperature extremes...

"Reports from the Laurel Starch Plant, Laurel, Miss. would seem to indicate that the Wennop is not only a good yielder of starch but yields starch of exceptional quality which requires less bleaching than does starch from other varieties."

ADMINISTRATIVE NOTES

Utility Contracts — It is probably an exaggeration, but the story is going around that one of our station superintendents got lost in the desert and was not found for 7 days. The only thing that saved his life, since he had no food with him, was the fact that he had one of his station utility contracts in his pocket. There were enough provisions in it to keep him alive for the week.

Under the circumstances, then, you will not mind, we hope, if attention is directed to the Comptroller General's decision authorizing the adoption generally of the procedure of having agreements to furnish public utilities services at stipulated rates "until further notice." Of course, this Division has always followed this practice in so far as contracts for electricity, gas and water are concerned, but the Comptroller General's decision also affects telephone contracts.

Therefore, in securing new telephone contracts, the words "and thereafter until further notice" should be inserted after the words "for the fiscal year ending June 30, 19__" at the top of Standard Form No. 40. However, in cases where numerous supplemental contracts are required, to cover changes in service, such contracts should be renewed annually in order to provide an up-to-date recapitulation of the services to assist us in checking the bills.

Leave — The Autumn leaves are falling pretty regularly these days, but Roy Gillette is complaining that they often fall in the wrong place. No, you are mistaken; we are not talking about trees. The autumn leaves we have in mind are leaves of absence being taken by our workers. And the things that fall in the wrong place very often are the applications for leave. Please send leave applications through your section leader. They have to be approved by him first, and when they come to Dr. Auchter direct, time is lost in sending them back to the section leader for approval.

Holidays — Telephone calls received just before Thanksgiving show that some of our workers have forgotten the order issued by the National Emergency Council on January 28, 1936, to the effect that employees will NOT be excused for any part of the day on the day before Washington's Birthday, Memorial Day, Independence Day, Labor Day or Thanksgiving. Employees who can be spared will be excused for one-half day Christmas and New Year's eves.

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

S E M I - M O N T H L Y N E W S L E T T E R

The official organ of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

John A. Ferrall, Editor

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New Lettuce Variety. The Country Gentleman for November discusses under "Crops" a promising new lettuce variety. The writer, C. H. Nissley of the New Jersey Agricultural Experiment Station, secured the seed of the new variety from Dr. Ross C. Thompson of our Division. The new variety is one of the results of our lettuce breeding work, started at Arlington Farm in 1929 and moved to the U. S. Horticultural Field Station at Beltsville, Md. in the spring of 1935.

As Mr. Nissley points out, it is of the Iceberg type and closely resembles lettuce shipped into the Eastern markets from California. It grows a large frame, forms a large solid head with crinkly or savoy leaves, and will not go to seed as readily as the ordinary type usually grown on upland soils--very gratifying when you remember that this lettuce breeding work was undertaken to develop strains of the crisp-head type adapted for the eastern United States.

Until within the last few years almost the entire crop of lettuce produced in New York State, New Jersey, North and South Carolina, Florida, and other parts of the East, was of the butter-head type, of which the Big Boston variety was the most important. With the increasing market demand for the hard headed Iceberg type of lettuce, however, eastern growers have been confronted with the serious problem of obtaining adapted strains of this type. As it became more difficult to market the Big Boston or butter-head lettuce, eastern growers attempted to shift their acreage to lettuce of the Iceberg type.

Many strains of the Iceberg from California have been tested in all parts of the East during the past few years in the hope of finding some that would be adapted. Almost without exception they have failed to produce a profitable crop under eastern conditions. Since eastern

growers are no longer able to market profitably the Big Boston type lettuce and do not have adapted strains of the Iceberg type, they are gradually losing their market to western growers of Iceberg. It was this problem confronting eastern lettuce growers that prompted the lettuce breeding program now beginning to yield results.

Seventeen intervariety crosses were made in the spring of 1929. Since then many other crosses have been made and their progenies tested.

After seven generations of selfing and selection a strain was developed from one of the original crosses which gives promise of being adapted for at least some parts of the East. This strain was introduced last spring as Columbia No. 1. Trials of it especially in New Jersey were very encouraging. The showing of this strain in comparison with some of the best of the California strains in Bergen County, N. J., led State Extension Horticulturist, C. H. Nissley, to mention it in the article in the November, 1936, issue of the Country Gentleman, to which we have already referred.

Columbia No. 1 is a large, dark green, heavily savoyed lettuce resembling the lettuce shipped to the eastern markets from the West. Trials indicate it to be more resistant to heat, slower to shoot to seed, and better adapted for eastern soil and climate than the present commercial strain of crisp-head lettuce. Its parents were the old standard summer head variety Hanson and the widely grown variety of New York which has long been one of the leading varieties in California.

Some other strains now under test but not yet ready for general distribution to growers give promise of being even more desirable for eastern conditions than Columbia No. 1.

A new strain which we plan to introduce during the coming season as Cosberg has indicated marked resistance to tipburn which causes considerable loss in every section where head lettuce is grown during warm weather. Cosberg is the result of selection from a cross between the standard variety Iceberg and Paris White Cos.

There is good reason to believe that with a few more years of breeding for adaptation we will be able to give eastern growers, who in the past have been able to grow good crops of butter-head lettuce, strains of crisp-head which can be grown profitably.

One of the interesting things in connection with Columbia No. 1, as Mr. Nissley points out, was the fact that every grower he talked with was planning to save some of this seed for planting this fall, because they felt that the strain was far superior to that they had been growing--and they wanted to make sure to have enough seed.

ENCOURAGEMENT OF PECAN EXPORTS

A release from the Department's Press Service states that exports of a limited quantity of unshelled pecans will continue to be encouraged under a program approved by the Secretary for the 1936-37 marketing season, as announced by the Agricultural Adjustment Administration.

"In general, the program is similar to one in effect during the last marketing season. Under the program for the current marketing season, the Secretary will invite exporters of pecans to make offers to sell for export, between the date on which the offer is accepted by him and June 30, 1937, unshelled pecans produced in the United States which are not below the medium size and No. 2 quality specified in the U. S. standards for unshelled pecans.

"In making the offer, each exporter would agree to export at least 1,000 pounds of unshelled pecans, and would specify the maximum volume that he expects to export. For the pecans exported, the Secretary would make to the exporter, whose offer is accepted, an export benefit of 5-1/2 cents per pound on medium size pecans not below No. 1 quality, and 6-1/2 cents per pound on pecans larger than medium size and not below No. 2 quality. The pecans exported must have been sold between the date of acceptance of the offer by the Secretary and June 30, 1937, and must be exported before October 16, 1937.

"Developed at the request of growers and representatives of cooperative and independent distributors, the program is designed to encourage for pecans export outlets which appear promising. Pecans are not commercially produced in any foreign country except in Mexico, where production is confined to the seedling type. Total production of improved pecans in the United States averaged nearly 14 million pounds annually during the 10-year period up to 1936. Production in 1935 totaled 16,445,000 pounds.

"Industry reports indicate that of this orchard run production, 13,100,000 pounds were merchantable and the carryover from the 1934 crop amounting to one million pounds resulted in a total supply of 14,100,000 pounds in 1935. The November 1 crop report of total production indicates a 1936 crop of improved pecans totaling 16,600,000 pounds, of which merchantable pecans are expected to approximate 13,900,000 pounds. This quantity plus the estimated carryover of 2 million pounds is expected to result in a total supply for 1936 of 15,900,000 pounds, approximately 1,800,000 pounds in excess of the 1935 supply.

"Through the program to encourage exports, the industry hopes to strengthen domestic markets and continue efforts to develop foreign outlets for pecans so that returns to domestic growers may be increased."

NUT INVESTIGATIONS

Max B. Hardy, Albany, Ga.

Writing from the U. S. Pecan Field Station and Laboratory, on November 23th, he says: "The harvest of nuts from the old seedling trees at Philema progressed slowly in part due to the heavy foliage on the trees and in part to the cold and windy weather. However, the next week should see the harvest of these trees completed unless further retarded by bad weather as the trees are almost completely defoliated at this time. This defoliation took place in about three hours on Saturday morning as a result of the first real freeze Friday night, the temperature dropping to 24°F. In the past several years I have never seen defoliation as rapid as that which has just occurred. Whether the temperature dropped low enough and rapidly enough to cause any injury to the wood is unknown at this time."

He had written November 21: "The outstanding event of the week was the harvest of the Alley trees in the G. M. Bacon orchard. A heavy yield was expected but not to the extent which occurred. The detailed data for the different treatments are not yet available, but it is a pleasure to report an average yield per tree on the basis of the 29 record trees of approximately 84 pounds per tree. The heaviest yield per tree was recorded as 117 pounds. These nuts were fairly well filled.

"The prospects for a crop next year are not very good as a consequence of the heavy yield and somewhat less than best filling. However, the foliage is still in fairly good condition and, with the trees thinned, a small yield may be obtained. It will certainly be of great interest and value to watch the future results of this experimental block.

"Two heavy frosts occurred during the week and kudzu was killed to the ground. Foliage on sprayed pecan trees is still heavy, but shows some frost burn. No rainfall was received during the week, the days being warm and sunny."

C. E. Schuster, Corvallis, Oreg.

"A survey of winter injury on walnuts and filberts show severe damage this fall. In some sections trees were noted where practically all of the new growth had been killed back to the old wood. This means that the trees will have to make a second start next year, and we are somewhat doubtful as to the results....No rain has occurred as yet--November 28--the Willamette river at Portland being the lowest since 1890. With low tide in the ocean the Willamette is now 6 inches below sea level. With Portland over 100 miles from the seacoast, the Willamette River at Portland is showing a tide of 2-1/2 to 3 feet."

NUT INVESTIGATIONS

Alton H. Finch, Tucson, Ariz.

"Pecan harvests in the Yuma valley have in the past been accompanied by certain discouraging losses and expenses," he comments. "Among these are: Delayed harvest, due to poor separation and opening of the shucks; preharvest germination, due largely to the close adherence of the moist shuck to the shell; poor coloring of the shell, apparently related to immaturity and delayed separation of the shuck; and finally an expensive harvest, due to the difficulty of thrashing nuts from the tree and of removing the shucks from the nuts.

"Another most important source of loss has been the poor filling of nuts toward which efforts have been directed in the past several years. Through the studies reported in a recent technical bulletin of the Arizona Experiment Station, the losses from poor filling have been substantially reduced and this year attention has been centered upon the harvest problems.

"Information has been gained which gives promise of radically changin the methods of harvesting and of having a profound effect upon the success o the pecan industry in the Southwest. These developments center around the use of ethylene gas, which has been found to be as effective in loosening the shucks of pecan nuts as of walnuts.

"In Arizona, as elsewhere, the custom has been to wait upon the opening of the shucks to begin pecan harvest. It is during this period and after the kernels have reached approximately maturity that much of the preharvest germination occurs. In many varieties a completely satisfactory condition of shuck opening is seldom attained, but as soon as it is at all possible the nuts are thrashed from the trees. Immediately after thrashing the shucks which still adhere to a large percentage of the nuts are removed, usually with considerable labor and expense and the nuts then allowed to dry until ready for market. From studies made during the harvest period just past, it seems that certain changes can be made which will hasten the harvest, reduce the cost, reduce the percentage of preharvest germination, and improve the color of the shell.

"Instead of waiting upon shuck opening to begin harvest, the nuts should be gathered as soon as maximum quality of the kernel is attained. At this time the nuts do not come off the trees readily and it will be necessary to pick the nuts allowing them to fall to sheets spread below, rather than thrash them. Some growers are already using this method and find it preferable to thrashing. As soon as picked, the nuts will be placed in ethylene gas chambers for 24 to 48 hours to completely loosen the shucks. Then, without removing the shucks, the nuts will be spread out to dry. Drying in contact with the shuck provides for normal coloration of the shell. After drying for 5 to 10 days the shucks are easily removed at almost no cost and the nuts ready to be graded and marketed.

(continued)

NUT INVESTIGATIONS

Alton H. Finch (continued)

"The present indications are that in this region of high fall temperatures, optimum quality of the kernel may often be attained before the shucks open well. With the use of ethylene it becomes possible to base the time of gathering upon the quality of the kernel and to make harvest operations independent of the opening of the shucks. Our need now is for an accurate index of optimum kernel quality."

J. R. Cole, Albany, Ga.

"We are in the midst of an extended drought at present," he writes November 21. "Winter cover crops are suffering, and in some instances there has not been sufficient moisture to germinate the seed. However, the vetch in the Taylor orchard was planted early in September and looks very well."

HANDLING, TRANSPORTATION AND STORAGE INVESTIGATIONS

Edwin Smith, Wenatchee, Wash.

"Dr. Gerhardt, Mr. Ezell and the writer made our first 1936 examination of Delicious apples during the week ending November 28, giving attention to those lots stored in various concentrations of CO_2 gas at 45° in comparison with lots stored without gas at 32 and 45°.

"It is very apparent that the Delicious apple does not respond so favorable as some other deciduous fruits where stored in CO_2 gas. Moreover, loss of varietal flavor, under the influence of the gas, is more marked than it is with some other deciduous fruits."

U. S. ONIONS TO ENGLAND

A "sample" shipment of 50,000 pounds of onions, says an Associated Press report, left New York City December 4 for England, cut off from its normal supply by the Spanish civil war, and if approved will be followed by a consignment of 15,000,000 pounds. The British Government has decided to establish a food defense department. It will be the first shipment of onions of this size since 1914. Spain, the main source of British supply for the last 25 years has been bottled up by civil strife and England has turned first to Hungary and then to the United States for its supply of onions.

DECIDUOUS FRUIT INVESTIGATIONS

Elmer Snyder, Fresno, Calif.

Writing on November 21 he says: "No killing frost had occurred up to November 19th. In 1935 a temperature of 27°F. was recorded at the Fresno station on October 31 with several light frosts previous to that date. The non-occurrence of frost at this late date in November has prompted the continued shipments of late grape varieties. A lighter crop and an increased demand has resulted in better prices to the growers generally for their grape crop over that received in 1935.

"Grape Breeding.--Additional grape seedlings fruited during the 1936 season. Of greater interest, however, was the production of some of the selected seedlings which had been grafted in five vine checks for production tests. Much better fruit was observed on these vines grafted than on the original seedling roots. More trellis space and better pruning wood to some extent accounts for the improved fruit.

"Grape crosses were continued during the 1936 blossoming season. Additional controlled crosses were made using mostly pollen from seedless varieties. Several crosses were made by using the pollen from the Sultanina Tetraploid and seeds have been obtained from these crosses. The seeds from all crosses and from 32 selfed varieties have been collected, cleaned and stored for planting. The number of good seeds obtained this season from controlled crosses represented 13.7 percent of the number of emasculated blossoms. Some crosses yielded seeds equal to 50 percent of the number of emasculated blossoms while others yielded only 2 percent.

"The grape nursery was taken up late in October. Propagation tests were continued during the 1936 season for comparison with the season of 1935. Records were obtained on spacing of cuttings in the nursery row, size of cutting, location of the bottom cut and type of cut, time of making the cuttings, and cuttings obtained from different experiment vineyards (Fresno, Oakland, and Shafter). Records were also obtained from cuttings made of differed aged parent vines, from 1,4,5,and 34-year-old vines of the same variety.

"Under comparable conditions, large cuttings placed 3" apart rooted as well as small cuttings planted 12" apart but did not grow as large. Forty-eight plants growing 12" apart produced more than twice the growth of 149 plants 3" apart. While the food supply and the available root area is a limiting factor, it has been apparent that small cuttings, if no others are available, can produce just as good if not better rootings if they're spaced sufficient distance in the nursery row. Cuttings made at Oakville produced slightly superior rootings than the same variety cuttings from either Shafter or Fresno, but not as striking a difference as during the 1935 season. The time of making the cuttings extending from November 22 to February 6 did not show a significant difference in the rooting ability or quality of the top and root growth. Making the basal cut just below the node appeared to produce the greatest combined top and root growth while making the basal cut through the node produced slightly greater root weight."

DECIDUOUS FRUIT INVESTIGATIONS

George F. Waldo, Corvallis, Oreg.

"The major portion of the week was occupied in a study of winter injury on raspberries and strawberries," he says in his report for the November 16-21 period. "During the early part of the month temperatures were below freezing, ranging from 22 to 29 degrees for several days. The result of these temperatures was not marked in raspberries and only in the most tender blackberries was there any injury to buds.

"Unrooted tips of trailing berries, however, showed some injury. No injury was noted in well rooted strawberry plants but due to the dry weather a large number of runner plants have failed to take root. As a result of the low temperatures the fruit buds from 70 to 90 percent of these plants are killed and the lower portion of the crowns where the roots have started to come out also show considerable injury."

W. W. Aldrich, Medford, Oreg.

"Top and root weights of the 2-year-old trees moved from out wet and dry plots show the top-root ratio of the dry trees to be 1.41 ± .09 and for the wet trees to be 1.68 ± .07," he writes from the U. S. Pear Field Station on November 16th.

"The greater top-root ratio of the trees from the wet plot is not statistically significant, although the slight difference is in the direction I should expect. We are now leaving 14 trees in each plot for another two years' growth. At the end of that time, if labor is available, top-root ratios can again be determined.

"John Grim has been taking over the weekly examination of small roots in the top foot of soil, preparatory to carrying on the routine observations during December and January. We were surprised to find that in New Frequent plot, which had an irrigation after harvest, a disintegration of the small rootlets appeared between November 2 and 16; whereas in New Dry plot, with available soil moisture nearly depleted, the white rootlets were turning brown during this period but were not showing any disintegration of the outer layers.

"Although the basic reasons for this difference in root behavior is not known, such difference in root behavior would seem to explain why trees irrigated after harvest have for two years shown an abnormal development of the foliage in the spring."

DECIDUOUS FRUIT INVESTIGATIONS

H. F. Bergman, Amherst, Mass.

"During the week I saw some berries from a storage experiment which the State Experiment Station has been carrying," he writes from the Cranberry Disease Field Laboratory at East Wareham, Mass. for the week ending November 21.

"Early Black berries were picked September 9, at which time they were only about half-colored. These were then stored at 30, 35 and 50° cold storage, and in several different growers' greenhouses which had a mean temperature of about 60°F.

"By November 15 the berries which had been stored at 50° had developed a dark red color nearly as dark as berries picked about the end of September. Berries held at 30° remained practically unchanged; those at 35° colored a little. Those at 60° were markedly less well colored than those at 50°.

"Storage losses due to shrinkage and decay were least at 30°, only a little more at 35°, but increased materially at higher temperatures. A temperature of 50°, all things considered, seems to be a good storage rate. There is no advantage of storage at temperatures below 35°."

John C. Dunegan, Fayetteville, Ark.

"Director C. C. Randall of the University of Arkansas Extension Service has reported the 1936 crop season will be an outstanding one for Arkansas in spite of the losses resulting from the early spring freeze and the summer drought," he writes November 28. "Director Randall enumerated the following items to show the increase in farm prosperity in 1936:

"Bumper cotton crop, increased yield per acre, average price of 12 cents a pound.

"The indicated 7,738,000 bushel rice crop, approximately 1,400,000 greater than last year.

"The income of $1,097,250 to peach growers, exceeding even that of the productive crop in 1932.

"Highest prices for Irish potatoes in many years.

"Increased acreages for pasture and soil building crops, forecasting better crop yields in years to come.

"An additional income of near $11,000,000 to 120,000 farmers cooperating in the agricultural conservation program.

"Favorable outlook for products of livestock producers in the coming year, recovered pastures, good prices."

DECIDUOUS FRUIT INVESTIGATIONS

R. B. Wilcox, Pemberton, N. J.

"Most cranberry reservoirs are well filled," he writes from the Cranberry and Blueberry Disease Laboratory on November 30th. "Knowing that they can apply the water whenever needed, most growers will not put the winter flowage on their bogs for about another month. A few bogs, however, which have to depend upon rainfall and surface run-off have begun to collect water. Considerable sanding and re-sanding of bogs is under way. Most of this will be finished before the application of winter flood; the exceptions are on those bogs where sanding will be done during the winter, on the ice, if possible, and the few cases where growers make a practice of sanding through the water, from boats.

"Blueberry pruning is under way in most fields. In general, the good growth during the past summer, and the present condition of the bushes, are unsatisfactory. This was almost inevitable after the heavy freeze of last spring, the excessive heat of midsummer, and the subsequent dry spell. The 'blueberry fertilizer,' very rich in inorganic nitrogen, has been used to excess in some fields, and has contributed to the production of succulent growth, some of which has been already killed by freezing."

W. W. Aldrich, Medford, Oreg.

Writing from the U. S. Pear Field Station on November 30th he says: "Nitrogen analysis has been completed for the present, and power to the laboratory turned off. Nitrogen determinations on nitrogen fertilized and unfertilized nitrogen-deficient Anjou trees show that the nitrogen application increased the nitrogen content of the blossoms just before full bloom and resulted in the fruit having from 50 to 100 percent more nitrogen at harvest. Heavy pruning of these trees likewise increased the amount of nitrogen in the fruit."

ADMINISTRATIVE NOTE

Holiday Mailing "The National Emergency Council has transmitted to the Department a request of the Acting Postmaster General that all Government departments withhold from the mails from December 15 through December 24, 1936, all bulk mailings of forms, pamphlets, books, and other printed matter, as well as supplies for regional offices, and registered matter not having urgent time value," says Division of Operation Circular No. 4, sent out by Mr. Haley early in the month.

"These bulk mailings not only seriously interfere with the expeditious handling of Christmas mails, but, owing to the heavy weight of many of the sacks, they no doubt cause some damage to the parcels mailed at that season of the year."

WHEN YOU TURN OVER THAT NEW LEAF ON JANUARY 1--

Remember to write down that when you enter an office you should make up your mind that you are going to work for your employer's interests as you would for your own. In the long run, the success of your employer means success for you. Too, an employer's success quite often depends upon his subordinates. An executive sometimes even rises or falls on the work of his stenographer-secretary. One executive in a large organization had his career ruined because he was believed by the Board of Directors to be responsible for the grammatical errors, misspellings and general lack of neatness in his reports and correspondence. He was one of those men who do not worry over such "trivial" things; and his secretary apparently didn't care either.

Your employer may not seem to appreciate your work, but do not forget that every man who occupies an executive position has many worries that may occupy his mind for long periods to the apparent exclusion of a proper consideration of his subordinates. This is the price he pays for his success, and it is the price you, too, will pay some day if you succeed. Expect ot meet this situation and to encounter rebuffs and disappointments. No one ever advanced who could not rise above them. In time, good work will be appreciated by the average employer. So long as you accept the salary he is willing to pay, however, be loyal to his interests. If you become convinced that you are not being treated fairly, change your job. Make it a point of honor never to discuss your employer's business affairs with outsiders, or even with fellow workers who are not entitled to know about them.

Don't be a shirker. It takes less time to do things well than it often takes to avoid doing them. There is an approved way of doing most things in your office, methods adopted after due consideration to simplify the handling of the work. Follow these rules and regulations carefully. If you think you can improve on them, write out your suggestions and submit them to your employer, but until they are adopted observe the regulations in force. Many employees are rated less than excellent not because of any lack of ability or intelligence, but because of their carelessness and indifference. In almost any office where instructions are issued to use, say, a pink form in ordering supplies, it is almost certain that 20 percent of the orders the next day will come in on white paper. If four copies of a form are requested, two or three are certain to be received in a number of cases. Only by continually returning the incorrectly prepared forms or letters for correction can some employees be impressed with the importance of following instructions. Thus it is said that some workers receive only $3 a day because a $5 a day man has to be employed to tell them what to do and how to do it. It is easy to forget how things should be done--but just as easy to keep instructions or sample forms at hand to show how to do them correctly. Try to see that each piece of work is done as well as you can do it, regardless of the pressure, for you may be judged by some one who will not know that the work was done under pressure.

--Office Practice

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THE DIVISION OF FRUIT
AND VEGETABLE CROPS AND DISEASES

SEMI-MONTHLY

NEWS-LETTER

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

C O N T E N T S